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CATTLE COMMISSIONERS

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ANNUAL REPORT OF THE
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ANNUAL REPORT

OF THE

BOARD OF CATTLE COMMISSIONERS

1896

OF THE

COMMONWEALTH OF MASSACHUSETTS,

IN ACCORDANCE WITH SECTION 51 OF CHAPTER 491 OF
THE ACTS OF 1894.

JANUARY 11, 1897.

BOSTON:

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1896

REPORT.

To the Honorable Senate and House of Representatives.

In conformity to section 51 of chapter 491 of the Acts of the year 1894, the Board of Cattle Commissioners presents the following report of its work for the year 1896.

The law of 1894 has continued to be the basis of the work of the Board during the year, except as it was modified by the Legislature of 1896. The work has been continued under the following heads:—

First.—The supervision and direction of the local inspectors of animals and provisions, appointed by cities and towns under the provisions of chapter 491 of the Acts of 1894.

Second.—The examination of all animals quarantined by local inspectors as suspected of being afflicted with contagious disease.

Third.—The examination of cattle coming into the markets at Brighton, Watertown and Somerville from without the State for sale, and without certificates of having passed the tuberculin test before entering the State.

Fourth.—The examination of cattle coming from without the State upon special permit.

Fifth.—The examination of stables, etc., with a view to secure better sanitary conditions, for the prevention of disease.

Sixth.—The conduct of laboratory and stable experiments, to determine various problems connected with the work of the Board.

The work of the Board was quite thoroughly examined during the last session of the Legislature by the joint committee on agriculture, in a hearing which occupied several protracted sessions. The critics of the Board presented statements and criticisms in support of bills which they presented, restricting the use of tuberculin, changing the methods of local inspection, and abolishing the commission

and transferring its duties to the State Board of Agriculture. The only result was the continuance for another year of the provision of the statute limiting the use of tuberculin to tests of foreign cattle at the public markets, and of animals reported as suspicious by local inspectors. The testing of cattle in response to voluntary requests was forbidden. In view of the conditions prevailing, the commission did not seriously oppose the continuance of the restriction of the use of tuberculin, although it did not meet their approval. A large number of the leading farmers, cattle owners and agricultural experts in the State testified their approval of the methods of the commission and of their use of tuberculin; and several leading veterinarians from other States voluntarily appeared to urge the committee to sustain the commission, they believing that its methods and plans were wise and necessary, and for the public good.

For several months following the date of the last annual report the work of the Board was hindered by lack of means for testing and disposing of the cattle reported by the local inspectors as suspected, on physical examination, of tuberculosis.

The fact of the rapid accumulation of this class of cases was set forth in our last annual report, together with the statute which prevented our prompt action upon them, which is section 37 of chapter 16 of the Public Statutes, as follows:—

No public officer shall make purchases or incur liabilities in the name of the Commonwealth for a larger amount than that which has been appropriated by law for the service or object for which such purchases have been made or liabilities incurred; and the Commonwealth shall be subject to no responsibility for the acts of its servants and officers beyond the several amounts duly appropriated by law.

As stated in our last report, “The commission considered it more desirable to incur the expense of making the examinations as soon as possible after receipt of the notice, freeing such animals as were found not to be tuberculous, and keeping the others in quarantine until it became possible, by

means of a further appropriation, to compensate the owners for their losses and destroy the animals."

To prevent as much as possible this unnecessary expense, the Board adopted General Order No. 12, and forwarded it to all the inspectors, in the following communication :—

COMMONWEALTH OF MASSACHUSETTS.

BOARD OF CATTLE COMMISSIONERS,
SECRETARY'S OFFICE, 52 VILLAGE STREET, BOSTON, Feb. 3, 1896.

To Inspectors of Animals and Provisions.

The Board of Cattle Commissioners regrets having to inform you that the appropriation of money for carrying out the provisions of chapter 491 of the Acts of 1894, as amended by chapter 496 of the Acts of 1895, has become exhausted, and that because of this fact the Board is compelled, under the provisions of the statutes, to do everything in its power to stop further expenditures under the said acts.

In accordance with these facts, at a meeting of the Board held on Jan. 29, 1896, the following order was passed :—

General Order No. 12.

It is hereby ordered that the further inspection of animals directed to be made by the inspectors of animals and provisions for the several cities and towns of this Commonwealth, under section 4 of chapter 491 of the Acts of 1894, as amended by section 1 of chapter 496 of the Acts of 1895, and in accordance with General Order No. 6 of this Board, communicated to you in a circular letter dated July 22, 1895, shall be stopped until further notice from this Board.

FREDERICK H. OSGOOD, *Chairman.*

CHARLES P. LYMAN, *Secretary.*

MAURICE O'CONNELL,

LEANDER F. HERRICK,

CHARLES A. DENNEN,

Board of Cattle Commissioners.

In spite of these precautions, however, before the appropriation authorized by the Legislature was available there were 1,043 such cattle in quarantine, scattered through all parts of the State. These animals had been kept in quarantine, awaiting the appropriation of funds by the Legislature, at an expense to the State of \$28,223.43. On June 5 the

work of cleaning up this accumulation was begun, and it was completed as soon as possible.

Under the provisions of the statutes, the executive officials of all cities and towns in the State are required to appoint inspectors of animals and provisions to have general supervision of the inspection of domestic animals within the limits of their respective cities and towns, acting under oath. The duties of these inspectors are to examine, at the time of slaughter, all neat stock, sheep and swine slaughtered at slaughter houses licensed under the provision of law, to make inspections of neat cattle, sheep and swine at such times as this Board shall designate, and to make special inspection from time to time of animals reported as suspected of having any of the contagious diseases named in the act.

Under this provision the executives of the cities and towns have reported to the Board the following list of inspectors as serving during the year:—

Abington,	John M. Chamberlain.
Acton,	Moses A. Reed.
Acushnet,	Philip A. Bradford.
Adams,	Andrew G. Potter.
Agawam,	Edwin Leonard.
Alford,	Samuel K. Williams.
Amesbury,	Edwin S. Worthen.
Amherst,	Henry E. Paige.
Andover,	Chas. H. Newton.
Arlington,	H. L. Alderman.
Arlington,	Alonzo S. Harriman.
Ashburnham,	Chas. W. Whitney, 2d.
Ashfield,	Walter G. Lesure.
Ashfield,	Homer S. Day.
Ashby,	Chas. C. Damon.
Ashland,	Samuel D. Witt.
Ashland,	Arthur E. White.
Ashland,	Edmund A. Stone.
Athol,	Oscar F. Stearns.
Attleborough,	T. L. Swift.
Avon,	Chas. E. May.
Ayer,	William N. Dudley.
Auburn,	Emery Stone.
Barnstable,	Alfred Crocker.
Barnstable,	John J. Harlow.
Barre,	John L. Smith.
Becket,	Edwin Lee.

Bedford,	Henry Wood.
Belchertown,	Guy C. Allen.
Bellingham,	Carroll E. White.
Belmont,	Benj. A. Harris.
Berkley,	Chas. F. Paull.
Berkley,	Eliphalet Terry.
Berlin,	Robert B. Wheeler.
Bernardston,	Chas. Bowker.
Beverly,	Horace D. Lambert.
Billerica,	William H. Hutchins.
Blackstone,	Daniel H. Cooney.
Blackstone,	Elias M. Billings.
Blandford,	Janus W. Knox.
Blandford,	William H. Oatley.
Blandford,	E. B. Gibbs.
Bolton,	Henry F. Haynes.
Boston,	Alexander Burr.
Boston,	George W. Roberts.
Bourne,	Noble P. Swift.
Boxborough,	P. W. Cunningham.
Boylston,	George E. Gleason.
Boxford,	George B. Killam.
Boxford,	Chas. A. Andrew.
Bradford,	Doane Coggsweil.
Braintree,	James M. Cutting.
Brewster,	James S. Paine.
Bridgewater,	Calvin Pratt.
Brimfield,	Porter A. Parker.
Brockton,	Simeon Mitchell.
Brockton,	Lucas W. Alden.
Brookfield,	Lewis Thresher.
Brookline,	Alexander Marshall.
Buckland,	William R. Shaw.
Burlington,	A. S. Lamb.
Cambridge,	Chas. E. Hadcock.
Canton,	Patrick J. Cronan.
Carlisle,	George P. Davis.
Carver,	Fred A. Ward.
Charlemont,	Horace Temple.
Charlton,	Stephen Hammond.
Chatham,	Isaac B. Young.
Chelmsford,	E. C. Perham.
Chelsea,	William Stinson.
Cheshire,	William P. Bennett.
Chester,	Daniel B. Holcomb.
Chester,	Edward L. Higgins.
Chesterfield,	George W. Rogers.
Chesterfield,	Clayton N. Rhodes.
Chicopee,	Irving H. Elmer.

Chicopee,	Thomas Goodwin.
Chilmark,	Freeman Hancock.
Clarksburg,	James Mixer.
Clinton,	Chas. H. Laselle.
Cohasset,	Caleb F. Nichols.
Colrain,	Hiram S. Meecham.
Concord,	Horace Tuttle.
Conway,	Gordon H. Johnson.
Cottage City,	E. G. Beetle.
Cummington,	Edward F. Warner.
Cummington,	Myron D. Trow.
Cummington,	Finley V. Bates.
Dalton,	William C. Brague.
Dalton,	William Miller.
Dana,	L. S. Blackmer.
Dana,	Alfred E. Doane.
Danvers,	Chas. S. Moore.
Dartmouth,	Chas. W. Howland, 2d.
Dartmouth,	Chas. H. Negus.
Dedham,	Creighton Colburn.
Deerfield,	D. A. Hawks.
Deerfield,	Edward D. Jewett.
Dennis,	Chas. E. Baker.
Dennis,	Edwin Whittemore.
Dighton,	William H. Walker.
Dighton,	Edmund Hathaway.
Dighton,	George A. Clark.
Douglas,	James Dermody.
Douglas,	E. P. Heath.
Dover,	S. O. Fowle.
Dracut,	Clement A. Hamblet.
Dudley,	Monroe W. Ide.
Dunstable,	Franklin M. Tolles.
Duxbury,	George Bradford.
Duxbury,	John K. Parker.
East Bridgewater,	W. T. Greene.
East Longmeadow,	Edwin Indicott.
Eastham,	J. Bradley Steele.
Easthampton,	Fordyce Whitmarsh.
Easton,	E. R. Hayward.
Edgartown,	Christopher R. Beetle.
Egremont,	Theodore S. Baldwin.
Enfield,	William H. Bush.
Enfield,	Albert R. House.
Erving,	Frank W. Loveland.
Essex,	Chas. A. Burnham.
Everett,	George Peabody.
Fairhaven,	E. G. Grinnell.
Fall River,	Hilaire Bisailon.

Falmouth,	Francis A. Nye.
Falmouth,	B. C. Cahoon.
Falmouth,	Henry C. Lewis.
Falmouth,	Asa P. Tobey.
Falmouth,	T. Lawrence Swift.
Fitchburg,	Otis F. Lord.
Florida,	Nathan W. Kemp.
Foxborough,	A. W. Draper.
Foxborough,	B. P. Crocker.
Framingham,	William R. Morrow.
Franklin,	Thomas L. Martin.
Freetown,	Palo Alto Pierce.
Freetown,	James Webb.
Gardner,	Frank B. Page.
Gardner,	Augustus S. Cleaves.
Gay Head,	Samuel J. Haskins.
Georgetown,	Samuel T. Poor.
Georgetown,	J. Winfred Yeaton.
Gill,	John L. S. Moore.
Gloucester,	Daniel G. Cressy.
Goshen,	Willis A. Smith.
Gosnold,	Joshua W. Tilton.
Grafton,	Perley Goddard.
Granby,	George L. Witt.
Granby,	Homer C. Taylor.
Granby,	Samuel A. Taylor.
Granville,	George W. Cone.
Granville,	Cyrus W. Ives.
Great Barrington,	Edwin Hurlburt.
Greenfield,	M. L. Miner.
Greenwich,	Walter N. Glazier.
Groton,	Samuel P. Williams.
Groveland,	Nathan Longfellow.
Hadley,	Homer L. Cowles.
Hadley,	Chas. H. Hunt.
Halifax,	Jabez P. Thompson.
Hamilton,	George E. F. Dane.
Hampden,	M. N. Warren.
Hancock,	James S. Goold.
Hanover,	Edwin B. Dwelley.
Hanson,	Ezra White.
Hardwick,	John N. Hillman.
Harvard,	M. A. Farnsworth.
Harwich,	John A. Baker.
Hatfield,	E. S. Warner.
Haverhill,	Grantley Bickell.
Hawley,	L. W. Temple.
Heath,	V. D. Thompson.
Hingham,	Robert F. Robinson.

Hinsdale,	Frank C. Phillips.
Holbrook,	Z. P. Jordan.
Holden,	Edward W. Merriek.
Holland,	A. J. Bagley,
Holliston,	I. A. Smith.
Holyoke,	Bernard S. Bigelow.
Hopedale,	Waldo Phipps.
Hopkinton,	W. W. Claffin.
Hubbardston,	John H. Burtch.
Hudson,	A. L. Cundall.
Hull,	Harvey T. Litchfield.
Huntington,	Frank T. Clapp.
Huntington,	Herman Burr.
Huntington,	Chas. H. Strong.
Hyde Park,	Joseph M. Kiggen.
Ipswich,	Edward Dole
Kingston,	E. Elbridge Atwood.
Lakeville,	Isaac Sampson.
Lancaster,	Henry H. Hosmer.
Lanesborough,	F. D. Deming.
Lanesborough,	William P. Talcott.
Lawrence,	John F. Winchester.
Lawrence,	Valentine Sellers.
Lee,	John McAllister.
Leicester,	Edward Warren.
Lenox,	Chas. C. Flint.
Leominster,	George M. Kendall.
Leverett,	O. C. Marvell.
Lexington,	Chas. M. Parker.
Leyden,	Ezra Foster.
Lincoln,	Chas. S. Smith.
Littleton,	J. H. Murray.
Longmeadow,	Jairus R. Kibbe.
Lowell,	W. A. Sherman.
Ludlow,	A. L. Bennett.
Lunenburg,	Chas. E. Woods.
Lunenburg,	Micah M. Boutwell.
Lynn,	William E. Welts.
Lynnfield,	William R. Roundy.
Malden,	George R. Frye.
Manchester,	H. D. Lambert.
Mansfield,	Joseph N. Tibbetts.
Marblehead,	Amos P. Alley.
Marion,	George F. Richards.
Marlborough,	H. R. Stanhope.
Marshfield,	F. W. Hatch.
Mashpee,	Darius Coombs
Mattapoisett,	David H. Cannon.
Maynard,	Joel F. Parmenter.

Medfield,	Francis D. Hamant.
Medford,	Henry F. Moore.
Medway,	Edward Whitney.
Melrose,	William H. Dole.
Mendon,	Albert W. Gaskill.
Merrimac,	H. J. Cushing.
Methuen,	Edwin J. Castle.
Middleborough,	James A. Burgess.
Middlefield,	John P. Bryan.
Middleton,	Andrew W. Peabody.
Milford,	Waldo Phipps.
Millbury,	Henry W. Carter.
Millis,	Moses C. Adams.
Milton,	James Spencer.
Monroe,	A. H. Goldthwaite.
Monson,	W. H. Bugbee.
Monson,	Hiram D. Osborne,
Montague,	George H. Goddard.
Montague,	F. H. Giles.
Monterey,	Chas. W. Gregory.
Montgomery,	Samuel W. Coe.
Mount Washington,	Alfred S. Spurr.
Nahant,	Robert L. Cochran.
Nantucket,	Albert Easton.
Natick,	Walter P. Mayo.
Natick,	C. A. Partridge.
Needham,	S. O. Fowle.
New Ashford,	Van Ness Mallery.
New Bedford,	D. C. Ashley.
New Braintree,	Chas. A. Felton.
New Marlborough,	George A. Stevens.
New Marlborough,	L. P. Keyes.
New Salem,	Willard Putnam.
Newbury,	Asa Pingree.
Newburyport,	George W. Knight.
Newton,	J. R. McLaughlin.
Norfolk,	Andrew R. Jones.
North Adams,	A. A. McDonnell.
North Andover,	George S. Fuller.
North Attleborough,	Asa A. Newell
North Attleborough,	G. B. Draper.
North Attleborough,	T. L. Swift.
North Brookfield,	A. O. Boyd
North Brookfield,	B. F. Barnes.
North Reading,	F. Howard Mosman.
Northampton,	Dwight A. Horton.
Northborough,	F. H. Atwood
Northbridge,	George F. Nilsson.
Northbridge,	John Gunn.

Northbridge,	.	.	.	.	W. A. Bean.
Northfield,	.	.	.	.	R. C. Ward.
Northfield,	.	.	.	.	Frank E. Heald.
Norton,	.	.	.	.	Lester D. Blandin.
Norton,	.	.	.	.	Owen E. Walker.
Norwell,	.	.	.	.	J. Warren Foster.
Norwell,	.	.	.	.	Edwin C. Briggs.
Norwell,	.	.	.	.	Ashburton W. Pierson.
Norwood,	.	.	.	.	Albert Fales.
Oakham,	.	.	.	.	H. P. Austin.
Orange,	.	.	.	.	Amos Blodgett.
Orleans,	.	.	.	.	F. W. Higgins.
Orleans,	.	.	.	.	Edmund Linnell.
Orleans,	.	.	.	.	Gilbert A. Dodge.
Otis,	.	.	.	.	Edwin L. Downs.
Otis,	.	.	.	.	Alfred D. Jones.
Oxford,	.	.	.	.	F. L. Snow.
Palmer,	.	.	.	.	E. W. Phinney.
Paxton,	.	.	.	.	H. P. Bemis.
Peabody,	.	.	.	.	John E. Herrick.
Peabody,	.	.	.	.	Cyrus T. Batchelder.
Peabody,	.	.	.	.	Chas. Davis.
Pelham,	.	.	.	.	Eugene P. Bartlett.
Pembroke,	.	.	.	.	Clifford I. Rogers.
Pepperell,	.	.	.	.	Samuel P. Bancroft.
Pern,	.	.	.	.	King C. Phillips.
Petersham,	.	.	.	.	S. C. Goddard.
Phillipston,	.	.	.	.	F. J. Kendall.
Pittsfield,	.	.	.	.	George N. Kinnell.
Plainfield,	.	.	.	.	D. H. Gould.
Plainfield,	.	.	.	.	Edwin A. Atkins.
Plymouth,	.	.	.	.	Chas. B. Harlow.
Plymouth,	.	.	.	.	William T. Pierce.
Plympton,	.	.	.	.	Howard O. Bonney.
Prescott,	.	.	.	.	Elmer M. Aiken.
Prescott,	.	.	.	.	James D. Barnes.
Princeton,	.	.	.	.	George Mason, Jr.
Provincetown,	.	.	.	.	Daniel F. Lewis.
Quincy,	.	.	.	.	Timothy F. Ford.
Randolph,	.	.	.	.	A. L. Chase.
Raynham,	.	.	.	.	James O. Sturtevant.
Raynham,	.	.	.	.	Cyrus Leonard.
Reading,	.	.	.	.	Milton G. Parker.
Rehoboth,	.	.	.	.	Clarence J. Kingsbury.
Rehoboth,	.	.	.	.	John W. Chase.
Rehoboth,	.	.	.	.	Albert R. Lewis.
Revere,	.	.	.	.	Edwin S. Plaisted.
Richmond,	.	.	.	.	W. H. Branch.
Rochester,	.	.	.	.	Allen G. Ashby.

Rockland,	Chas. Winslow.
Rockport,	Alvin Sanborn.
Rowe,	E. M. Upton.
Rowley,	Daniel H. Hale.
Rowley,	J. Scott Todd.
Royalston,	George E. Peirce.
Royalston,	Joseph Stewart.
Royalston,	Eugene Twitchell.
Russell,	S. S. Shurtleff.
Rutland,	F. G. Bartlett.
Salisbury,	Samuel P. Merrill.
Salem,	Fred Saunders.
Sandisfield,	Chas. H. Callender.
Sandisfield,	H. S. Manley.
Sandwich,	Samuel H. Nye.
Saugus,	Arthur W. Sawyer.
Savoy,	Linus E. Perry.
Savoy,	Milton A. Bliss.
Scituate,	Caleb L. Damon.
Seekonk,	Olney Greene.
Seekonk,	Lowell M. Cole.
Seekonk,	Robert Woodward.
Sharon,	A. W. Draper.
Sheffield,	Henry C. Clark.
Sheffield,	Edwin L. Boardman.
Shelburne,	Lewis T. Covell.
Shelburne,	Alfred F. Skinner.
Shelburne,	H. L. Warfield.
Sherborn,	Jasper J. Smart.
Sherborn,	William A. Adams.
Shirley,	Samuel B. Scott.
Shrewsbury,	George L. Plympton.
Shrewsbury,	Jubal A. Gleason.
Shrewsbury,	David Barnes.
Shutesbury,	Oscar H. Shaw.
Somerset,	Thomas A. Francis.
Somerville,	Chas. M. Berry.
South Hadley,	Horace W. Gaylord.
Southampton,	Henry E. Coleman.
Southampton,	Michael Norris.
Southborough,	William H. Buck.
Southbridge,	Henry A. Morse.
Southwick,	Chas. W. Talmage.
Spencer,	Abraham Capen.
Springfield,	James Kimball.
Sterling,	W. S. Walker.
Stockbridge,	Marshall S. Heath.
Stockbridge,	John M. Buck.
Stoneham,	George H. Allen.

Stoughton,	James Murphy.
Stow,	Lewis Parks.
Sturbridge,	William Whittemore.
Sudbury,	Nahum Goodnow.
Sudbury,	George A. Haynes.
Sudbury,	Hiram Haynes.
Sunderland,	George P. Smith.
Sutton,	Edward A. Welch.
Sutton,	P. D. King.
Swampscott,	Samuel A. Spaulding.
Swanzey,	David B. Gardner.
Swanzey,	Anson L. Barney.
Swanzey,	Arthur W. Weaver.
Taunton,	Walter H. Haskell.
Templeton,	S. E. Greenwood.
Templeton,	W. F. Robie.
Tewksbury,	George W. Trull.
Tisbury,	Henry C. Norton.
Tolland,	Bentley Pratt.
Tolland,	C. N. Marshall.
Topsfield,	Eugene L. Wilder.
Townsend,	John N. Going.
Truro,	Josiah F. Rich.
Tyngsborough,	Franklin N. Tolles.
Tyringham,	Joseph Jones.
Upton,	George D. Whitney.
Upton,	Benj. A. Jourdan.
Uxbridge,	Chas. E. Seagrave.
Wakefield,	Henry C. Perry.
Wales,	W. W. Eager.
Walpole,	George S. Fuller.
Waltham,	William E. Peterson.
Ware,	A. A. Etienne.
Wareham,	Samuel M. Crocker.
Wareham,	James W. Hurley.
Warren,	Marcus Burroughs.
Warwick,	Gilbert Maynard.
Washington,	Chas. E. Schultz.
Watertown,	George W. Pope.
Wayland,	Thomas W. Frost.
Wayland,	Thomas Bryant.
Webster,	E. M. Frissell.
Wellesley,	S. O. Fowle.
Wellfleet,	George W. Nickerson.
Wendell,	George A. Lewis.
Wenham,	Henry Alley.
West Boylston,	John F. Knight.
West Bridgewater,	David R. Simmons.

West Brookfield,	E. B. Lynde.
West Newbury,	Alfred L. Moore.
West Springfield,	M. H. Bidwell.
West Springfield,	Henry A. Sibley.
West Stockbridge,	R. R. Bissell.
West Tisbury,	William Look.
West Tisbury,	William B. Luce.
Westborough,	Henry A. Gilmore.
Westfield,	William Arnold.
Westford,	George T. Day.
Westford,	A. P. Richardson.
Westhampton,	William J. Lyman.
Westhampton,	A. D. Montague, Jr.
Westminster,	M. D. Whitney.
Westminster,	E. L. Burnham.
Westminster,	A. E. Mossman.
Weston,	E. O. Clark.
Westport,	Edward S. Smith.
Westport,	Theodore B. Peirce.
Weymouth,	Hiram E. Raymond.
Weymouth,	Chas. E. Bicknell.
Whately,	Irving Allis.
Whitman,	Owen F. Bumpus.
Wilbraham,	Lyman Fiske.
Williamsburg,	George W. Lawley.
Williamstown,	Joseph D. Patterson.
Wilmington,	H. Allen Sheldon.
Winchendon,	William A. Deland.
Winchester,	Wm. B. Simonds.
Windsor,	H. Ward Ford.
Windsor,	G. L. Miner.
Winthrop,	C. Porter Tewksbury.
Woburn,	Edward P. McKenna.
Woburn,	James N. Stuart.
Worcester,	John P. Streeter.
Worcester,	J. Warren Ellsworth.
Worcester,	Thomas Monahan.
Worthington,	Albert J. Randall.
Worthington,	Horace F. Bartlett.
Wrentham,	Elisha M. Brastow.
Wrentham,	George B. Ware.
Yarmouth,	James Lack.
Yarmouth,	Isaiah Homer.
Yarmouth,	Isaiah Crowell.

The following are the orders relating to inspection of animals issued by the Board during the current year:—

COMMONWEALTH OF MASSACHUSETTS.

BOARD OF CATTLE COMMISSIONERS,
SECRETARY'S OFFICE, 52 VILLAGE STREET, BOSTON, Sept. 30, 1896.

To Inspectors of Animals and Provisions.

The Board of Cattle Commissioners beg to inform you that it desires to have a complete general inspection of neat cattle at once, and that such examination be completed soon enough to enable it to publish a complete result of the same in the coming annual report for 1896. In order to accomplish this, the following order was passed at a meeting held on Sept. 29, 1896 : —

General Order No. 14.

In accordance with the authority conferred upon us by section 4 of chapter 491 of the Acts of 1894, as amended by section 1 of chapter 496 of the Acts of 1895, you are hereby ordered to make an inspection of all neat cattle within your district. Such inspection is to be commenced on October 1, or as soon thereafter as possible, and to be continued with all possible despatch until finished, or until December 1, at which time it is hereby ordered closed.

It is further ordered that the returns directed by law to be made to this office shall be so made, on blank form No. 1, as often as once in each week during the whole period of inspection, in order that a close record may be kept of the number of animals that have been examined in each town as the work progresses. All inspectors' reports must be sent to the Boston office on or before Dec. 5, 1896.

We further beg leave to call your particular attention to that provision of section 4 of chapter 491 of the Acts of 1894, as amended by section 1 of chapter 496 of the Acts of 1895, which requires that all inspectors of animals and provisions throughout the Commonwealth "shall immediately inspect any and all domestic animals and any barn, stable or premises where any such animals are kept, whenever directed to do so by the Board of Cattle Commissioners, or any of its members." In accordance with this provision, this Board, at a meeting held on the twentieth day of September, 1896, passed the following order : —

General Order No. 15.

All inspectors throughout the Commonwealth are hereby directed to make a thorough examination of all barns, stables and premises where domestic animals are kept, and to report the results of these examinations upon form No. 20. It is further directed that this examination shall be made at the same time at which the regular general examina-

tion of the neat stock is made; and that the reports concerning the same shall be forwarded to this office, together with the reports of the examination of neat stock, on or before Dec. 5, 1896.

FREDERICK H. OSGOOD, *Chairman*.

CHARLES P. LYMAN, *Secretary*.

MAURICE O'CONNELL,

LEANDER F. HERRICK,

CHARLES A. DENNEN,

Board of Cattle Commissioners.

NOTICE.—A book containing a number of the required forms will be forwarded to you under separate cover. If more are required, they will be sent upon application.

COMMONWEALTH OF MASSACHUSETTS.

BOARD OF CATTLE COMMISSIONERS,
52 VILLAGE STREET, BOSTON, Dec. 2, 1896.

GENERAL ORDER No. 16.

To the Inspectors of Animals and Provisions.

SIR:—Inasmuch as the financial year closes on December 15, and the report of the Board of Cattle Commissioners must be in the hands of the Legislature on or before January 10, and you have not stopped your inspection, in accordance with General Order No. 14, sent you on September 30, which stated that such inspection “is to be commenced on October 1, or as soon thereafter as possible, and to be continued with all possible despatch until finished, or until December 1, at which time it is hereby ordered closed,” it was this day voted that no further inspection of animals should be made by you, or any animals quarantined except by instruction from the Board of Health of your city or town, as provided by section 30 of chapter 491 of the Acts of 1894, until the tenth day of January, 1897.

FREDERICK H. OSGOOD, *Chairman*.

L. F. HERRICK, *Secretary*.

JOHN M. PARKER,

MAURICE O'CONNELL,

C. A. DENNEN.

The regular inspection was ordered by the Board September 30, to begin October 1 and to be closed on December 1. Under this order the inspectors of the cities and towns have reported 8,969 animals suspected of contagious disease, — tuberculosis. These were subjected to the tuberculin test, and 4,694 were condemned and destroyed.

The following table shows the number of animals quarantined in the cities and towns; it also shows the number condemned and the amounts paid, but it does not include 550 animals which have been condemned and warrants for which are now in the process of settlement. The table also gives the State tax and number of neat cattle over one year old, as shown by the assessors' returns, May 1, 1896, in the respective cities and towns.

CITY OR TOWN.	Neat Cattle Assessed.	Number Tested.	Number Condemned.	Amount Awarded.	State Tax.
Abington,	272	2	-	-	\$1,750 00
Acton,	1,484	38	29	\$1,011 15	1,050 00
Acushnet,	437	-	-	-	437 50
Adams,	769	29	3	90 00	2,695 00
Agawam,	1,308	22	12	402 50	945 00
Alford,	299	-	-	-	157 50
Amesbury,	399	20	7	215 00	3,657 50
Amherst,	1,844	147	63	2,433 00	2,222 50
Andover,	1,018	69	26	955 00	3,430 00
Arlington,	239	1	1	20 00	5,635 00
Ashburnham, . . .	454	55	16	414 50	752 50
Ashfield,	1,309	54	24	618 72	367 50
Ashby,	538	92	37	1,195 50	367 50
Ashland,	392	27	21	613 00	857 50
·Athol,	490	20	7	185 00	2,642 50
Attleborough, . . .	758	46	20	866 00	3,220 00
Avon,	123	4	2	38 00	542 50
Auburn,	785	6	-	-	402 50
Ayer,	135	-	-	-	962 50
Barnstable,	607	5	2	95 00	2,695 00
Barre,	1,882	89	29	843 00	1,032 50
Becket,	634	-	-	-	332 50
Bedford,	594	25	20	615 00	682 50
Belchertown,	1,544	29	7	136 50	630 00
Bellingham,	520	48	28	723 00	490 00
Belmont,	185	-	-	-	2,642 50
Berkley,	381	1	1	10 00	315 00
Berlin,	590	3	3	62 00	350 00
Bernardston,	728	9	1	18 00	297 50
Beverly,	628	4	1	45 00	10,132 50
Billerica,	916	216	103	4,122 00	1,382 50
Blackstone,	339	4	3	62 50	1,890 00
Blandford,	908	4	2	40 00	315 00
Bolton,	819	41	19	537 00	332 50
Boston,	820	119	41	1,388 00	628,740 00
Bourne,	161	-	-	-	1,172 50
Boxborough,	550	16	11	390 00	157 50
Roxford,	617	19	11	352 00	437 50
Boylston,	782	27	12	365 00	350 00
Bradford,	320	-	-	-	1,925 00
Braintree,	399	-	-	-	3,115 00
Brewster,	195	-	-	-	437 50
Bridgewater,	493	40	18	708 00	1,767 50
Brimfield,	1,057	26	18	212 50	297 50
Brockton,	694	12	5	165 00	15,085 00
Brookfield,	731	50	11	370 00	1,050 00
Brookline,	427	5	5	210 00	41,632 50
Buckland,	691	19	4	48 50	420 00
Burlington,	543	11	10	287 50	350 00
Cambridge,	322	1	-	-	54,600 00
Canton,	465	10	3	90 00	3,027 50

CITY OR TOWN.	Neat Cattle Assessed.	Number Tested.	Number Condemned.	Amount Awarded.	State Tax.
Carlisle,	630	83	30	\$1,239 00	\$245 00
Carver,	155	-	-	-	577 50
Charlemont,	724	2	-	-	280 00
Charlton,	1,603	29	17	447 00	682 50
Chatham,	187	-	-	-	665 00
Chelmsford,	1,087	79	51	1,661 50	1,452 50
Chelsea,	80	6	1	27 50	15,802 50
Cheshire,	960	24	1	30 00	525 00
Chester,	637	13	-	-	455 00
Chesterfield,	702	2	2	35 00	210 00
Chicopee,	574	1	1	19 00	5,810 00
Chilmark,	141	-	-	-	157 50
Clarksburg,	345	-	-	-	175 00
Clinton,	170	8	5	170 00	4,865 00
Cohasset,	299	-	-	-	3,360 00
Colrain,	1,325	20	11	311 45	420 00
Concord,	1,419	93	29	786 50	2,940 00
Conway,	1,260	97	46	1,433 50	507 50
Cottage City,	120	-	-	-	980 00
Cummington,	593	5	-	-	227 50
Dalton,	416	26	6	175 00	2,047 50
Dana,	234	-	-	-	210 00
Danvers,	774	55	44	1,847 00	3,150 00
Dartmouth,	1,642	1	1	10 00	1,890 00
Dedham,	1,046	17	12	247 00	4,602 50
Deerfield,	1,576	26	9	240 00	1,155 00
Dennis,	221	1	-	-	1,172 50
Dighton,	367	4	3	52 50	595 00
Douglas,	339	8	4	101 00	735 00
Dover,	654	30	24	693 00	682 50
Dracut,	1,050	77	46	1,318 00	1,172 50
Dudley,	852	26	13	309 00	787 50
Dunstable,	602	15	7	152 00	210 00
Duxbury,	278	12	4	145 00	1,102 50
East Bridgewater,	529	29	13	261 00	1,155 00
East Longmeadow,	542	20	10	337 00	490 00
Eastham,	156	3	-	-	210 00
Easthampton,	705	10	5	144 00	1,750 00
Easton,	589	6	1	15 00	3,552 50
Edgartown,	338	-	-	-	525 00
Egremont,	908	3	1	25 00	332 50
Enfield,	455	5	-	-	560 00
Erving,	152	2	-	-	280 00
Essex,	495	-	-	-	700 00
Everett,	131	3	1	45 00	8,610 00
Fairhaven,	448	-	-	-	1,382 50
Fall River,	547	10	4	70 00	43,540 00
Falmouth,	424	2	-	-	4,287 50
Fitchburg,	770	38	19	555 62	13,860 00
Florida,	377	-	-	-	122 50
Foxborough,	383	13	4	75 00	1,190 00
Framingham,	1,148	15	6	167 50	6,527 50
Franklin,	667	111	90	3,494 00	2,100 00
Freestown,	306	9	4	90 00	630 00
Gardner,	543	96	32	1,254 50	3,552 50
Gay Head,	55	-	-	-	17 50
Georgetown,	279	-	-	-	752 50
Gill,	665	42	13	486 44	332 50
Gloucester,	569	-	-	-	11,375 00
Goshen,	355	10	2	45 00	105 00
Gosnold,	41	-	-	-	140 00
Grafton,	1,172	23	10	307 00	1,732 50
Granby,	1,130	23	19	427 50	332 50
Granville,	774	10	4	120 00	262 50
Great Barrington,	1,434	15	7	154 00	2,572 50
Greenfield,	919	98	53	1,783 20	3,727 50
Greenwich,	318	2	1	35 00	192 50

CITY OR TOWN.	Neat Cattle Assessed.	Number Tested.	Number Condemned.	Amount Awarded.	State Tax.
Groton,	925	32	16	\$530 00	\$2,047 50
Groveland,	222	1	-	-	700 00
Hadley,	1,381	53	17	523 00	735 00
Halifax,	143	-	-	-	192 50
Hamilton,	388	-	-	-	752 50
Hampden,	565	15	2	45 00	280 00
Hancock,	616	3	-	-	245 00
Hanover,	276	1	-	-	1,015 00
Hanson,	151	-	-	-	455 00
Hardwick,	1,714	31	20	601 50	1,085 00
Harvard,	1,272	78	34	1,147 50	717 50
Harwich,	186	2	-	-	875 00
Hatfield,	382	3	1	28 00	735 00
Haverhill,	902	46	19	657 00	14,735 00
Hawley,	583	-	-	-	122 50
Heath,	704	2	1	10 00	140 00
Hingham,	514	-	-	-	3,167 50
Hinsdale,	734	10	2	35 00	542 50
Holbrook,	140	-	-	-	945 00
Holden,	882	6	6	244 00	845 00
Holland,	149	10	3	135 00	70 00
Holliston,	649	7	7	202 00	1,207 50
Holyoke,	477	10	9	320 00	19,040 00
Hopedale,	103	-	-	-	1,820 00
Hopkinton,	801	77	42	1,396 50	1,470 00
Hubbardston,	846	50	31	883 00	490 00
Hudson,	422	25	12	323 50	2,082 50
Hull,	61	5	1	20 00	1,820 00
Huntington,	514	2	-	-	385 00
Hyde Park,	126	-	-	-	5,932 50
Ipswich,	838	33	21	753 00	2,065 00
Kingston,	195	-	-	-	1,172 50
Lakeville,	361	-	-	-	402 50
Lancaster,	638	21	16	505 00	2,082 50
Lanesborough,	940	4	2	35 00	367 50
Lawrence,	198	6	3	140 00	23,240 00
Lee,	741	32	11	373 00	1,295 00
Leicester,	535	3	-	-	1,645 00
Lenox,	729	22	2	75 00	2,082 50
Leominster,	778	40	20	444 00	3,990 00
Leverett,	473	19	15	466 50	210 00
Lexington,	1,013	55	25	761 50	2,852 50
Leyden,	439	3	1	35 00	122 50
Lincoln,	823	104	84	3,625 00	1,610 00
Littleton,	1,265	56	23	904 00	612 50
Longmeadow,	300	9	7	237 00	437 50
Lowell,	331	9	4	90 00	49,000 00
Ludlow,	1,046	33	17	451 50	752 50
Lunenburg,	819	71	47	1,372 50	560 00
Lynn,	307	150	30	1,134 00	34,667 50
Lynnfield,	254	109	56	2,726 00	420 00
Malden,	151	1	1	10 00	17,307 50
Manchester,	95	-	-	-	4,970 00
Mansfield,	219	13	2	30 00	1,277 50
Marblehead,	266	14	2	80 00	4,042 50
Marion,	117	1	-	-	577 50
Marlborough,	998	20	9	180 00	5,792 50
Marshfield,	404	53	26	914 50	945 00
Mashpee,	27	-	-	-	122 50
Mattapoisett,	210	1	1	12 50	1,050 00
Maynard,	312	8	3	95 00	1,470 00
Medfield,	489	2	-	-	997 50
Medford,	294	26	-	-	10,902 50
Medway,	430	8	5	148 00	927 50
Melrose,	224	-	-	-	6,877 50
Mendon,	586	3	1	10 00	385 00
Merrimac,	256	-	-	-	945 00

CITY OR TOWN.	Neat Cattle Assessed	Number Tested.	Number Condemned.	Amount Awarded.	State Tax.
Methuen,	1,345	30	7	\$270 00	\$2,467 50
Middleborough,	751	1	1	10 00	2,975 00
Middlefield,	470	10	1	20 00	175 00
Middleton,	247	42	41	1,470 00	367 50
Milford,	390	—	—	—	3,867 50
Millbury,	683	32	14	463 00	1,680 00
Millis,	440	8	2	53 00	595 00
Milton,	768	42	9	350 00	13,737 50
Monroe,	153	—	—	—	105 00
Monson,	1,304	21	8	205 00	1,400 00
Montague,	733	31	4	95 00	2,555 00
Monterey,	562	—	—	—	175 00
Montgomery,	339	1	—	—	105 00
Mount Washington,	79	—	—	—	52 50
Nahant,	42	—	—	—	4,042 50
Nantucket,	515	—	—	—	2,117 50
Natick,	587	36	16	479 50	3,990 00
Needham,	690	132	107	3,763 00	1,977 50
New Ashford,	143	—	—	—	52 50
New Bedford,	625	4	2	37 00	36,067 50
New Braintree,	1,240	6	2	30 00	297 50
New Marlborough,	1,607	53	4	119 50	402 50
New Salem,	362	16	5	147 00	227 50
Newbury,	1,116	1	1	30 00	752 50
Newburyport,	289	—	—	—	7,857 50
Newton,	1,100	89	52	1,873 00	32,077 50
Norfolk,	436	48	24	855 50	367 50
North Adams,	617	13	3	90 00	5,477 50
North Andover,	1,277	91	56	2,127 00	2,362 50
North Attleborough,	570	7	7	178 00	2,800 00
North Brookfield,	942	47	14	417 00	1,400 00
North Reading,	364	24	3	132 50	367 50
Northampton,	977	39	5	175 50	7,315 00
Northborough,	768	234	106	3,349 00	892 50
Northbridge,	403	28	11	390 00	2,537 50
Northfield,	1,094	3	3	42 50	682 50
Norton,	336	4	—	—	577 50
Norwell,	272	1	1	18 00	670 00
Norwood,	370	22	10	327 50	2,152 50
Oakham,	686	—	—	—	245 00
Orange,	737	44	29	878 00	2,817 50
Orleans,	212	1	—	—	490 00
Otis,	413	2	1	30 00	157 50
Oxford,	710	19	2	55 00	927 50
Palmer,	707	25	13	345 50	2,030 00
Paxton,	387	2	1	18 00	192 50
Peabody,	687	47	16	634 00	5,477 50
Pelham,	213	2	1	27 00	122 50
Pembroke,	177	3	—	—	472 50
Pepperell,	810	28	15	532 00	1,435 00
Peru,	379	3	1	30 00	87 50
Petersham,	533	6	2	80 00	455 00
Phillips-ton,	346	—	—	—	210 00
Pittsfield,	1,124	135	19	610 00	9,415 00
Plainfield,	572	8	—	—	122 50
Plymouth,	461	3	2	100 00	4,620 00
Plympton,	108	—	—	—	227 50
Prescott,	387	15	4	95 00	122 50
Princeton,	1,153	139	73	2,231 00	577 50
Provincetown,	54	—	—	—	1,592 50
Quincy,	610	4	2	47 50	11,777 50
Randolph,	202	—	—	—	1,645 00
Raynham,	420	2	—	—	630 00
Reading,	325	17	14	418 00	2,450 00
Rehoboth,	1,265	25	11	332 00	525 00
Revere,	145	—	—	—	4,585 00
Richmond,	468	—	—	—	245 00

CITY OR TOWN.	Neat Cattle Assessed.	Number Tested.	Number Condemned	Amount Awarded.	State Tax.
Rochester,	288	1	-	-	\$385 00
Rockland,	232	-	-	-	2,170 00
Rockport,	170	2	-	-	1,845 00
Rowe,	417	1	-	-	175 00
Rowley,	593	99	15	\$677 00	490 00
Royalston,	555	81	52	1,832 50	437 50
Russell,	143	5	-	-	350 00
Rutland,	908	65	23	392 50	367 50
Salem,	357	53	31	1,273 00	20,475 00
Salisbury,	469	39	-	-	465 00
Sandisfield,	880	47	18	517 00	245 00
Sandwich,	233	-	-	-	682 50
Saugus,	603	150	35	1,494 00	2,065 00
Savoy,	519	25	4	145 00	122 50
Scituate,	299	2	-	-	1,435 00
Seekonk,	909	26	9	325 00	612 50
Sharon,	362	19	8	240 00	1,137 50
Sheffield,	2,075	15	8	208 50	630 00
Shelburne,	1,214	88	24	796 61	647 50
Sherborn,	760	17	9	196 50	577 50
Shirley,	430	6	3	87 00	525 00
Shrewsbury,	1,277	5	-	-	700 00
Shutesbury,	131	-	-	-	122 50
Somerset,	375	-	-	-	752 50
Somerville,	275	4	1	25 00	30,205 00
South Hadley,	1,074	6	3	65 00	1,645 00
Southampton,	971	1	1	30 00	350 00
Southborough,	1,119	78	24	660 00	1,137 50
Southbridge,	770	58	-	-	2,852 50
Southwick,	833	2	2	30 00	385 00
Spencer,	1,226	5	4	79 50	2,922 50
Springfield,	427	47	18	554 50	41,072 50
Sterling,	1,487	79	50	1,227 00	612 50
Stockbridge,	791	7	3	69 00	2,170 00
Stoneham,	271	9	2	50 00	2,835 00
Stoughton,	337	3	1	15 00	2,117 50
Stow,	840	44	20	656 50	455 00
Sturbridge,	815	6	2	52 50	682 50
Sudbury,	1,245	159	145	5,044 50	822 50
Sunderland,	784	119	20	637 50	297 50
Sutton,	950	128	66	2,202 00	945 00
Swampscott,	70	92	33	1,519 50	3,955 00
Swansey,	888	-	-	-	612 50
Taunton,	796	8	2	45 00	13,965 00
Templeton,	524	21	10	321 00	980 00
Tewksbury,	546	112	74	2,544 00	1,050 00
Tisbury,	76	-	-	-	577 50
Tolland,	476	4	3	55 00	105 00
Topsfield,	700	52	51	1,902 50	612 50
Towusend,	427	17	8	228 00	840 00
Truro,	221	-	-	-	262 50
Tyngsborough,	378	16	3	77 00	280 00
Tyringham,	409	-	-	-	157 50
Upton,	547	10	6	178 00	735 00
Uxbridge,	710	-	-	-	1,592 50
Wakefield,	293	-	-	-	4,095 00
Wales,	228	-	-	-	210 00
Walpole,	527	28	12	321 00	1,452 50
Waltham,	762	350	227	9,181 00	13,055 00
Ware,	907	11	6	140 00	3,097 50
Wareham,	241	-	-	-	1,470 00
Warren,	1,376	46	24	779 00	1,960 00
Warwick,	274	15	6	170 00	227 50
Washington,	476	-	-	-	140 00
Watertown,	283	28	-	-	5,705 00
Wayland,	870	140	55	1,864 50	1,102 50
Webster,	258	24	17	393 50	2,695 00

CITY OR TOWN.	Neat Cattle Assessed.	Number Tested.	Number Condemned.	Amount Awarded.	State Tax.
Wellesley, . . .	287	10	5	\$96 50	\$4,655 00
Wellfleet, . . .	202	-	-	-	542 50
Wendell, . . .	191	-	-	-	175 00
Wenham, . . .	368	1	1	15 00	472 50
West Boylston, . .	697	14	6	124 00	962 50
West Bridgewater, .	766	6	3	48 00	700 00
West Brookfield, .	943	26	15	449 00	595 00
West Newbury, . .	823	5	1	40 00	700 00
West Springfield, .	656	4	3	125 00	2,887 50
West Stockbridge, .	399	-	-	-	402 50
West Tisbury, . .	238	-	-	-	280 00
Westborough, . . .	1,235	114	63	1,702 50	1,960 00
Westfield, . . .	976	3	2	20 00	5,547 50
Westford, . . .	794	17	5	149 00	962 50
Westhampton, . . .	469	-	-	-	175 00
Westminster, . . .	612	42	32	1,038 50	542 50
Weston, . . .	1,003	102	19	607 50	2,502 50
Westport, . . .	1,175	24	13	310 50	1,102 50
Weymouth, . . .	530	2	2	15 00	4,777 50
Whately, . . .	805	27	10	197 00	332 50
Whitman, . . .	333	8	5	81 00	2,555 00
Wilbraham, . . .	750	72	21	640 00	595 00
Williamsburg, . . .	720	14	5	145 00	665 00
Williamstown, . . .	1,362	-	-	-	1,767 50
Wilmington, . . .	245	48	40	1,473 86	630 00
Winchendon, . . .	498	7	2	50 00	1,645 00
Winchester, . . .	198	-	-	-	4,532 50
Windsor, . . .	744	15	12	364 00	140 00
Winthrop, . . .	91	-	-	-	3,045 00
Woburn, . . .	323	12	5	175 00	6,795 00
Worcester, . . .	2,038	38	26	835 50	63,507 50
Worthington, . . .	854	43	13	391 00	227 50
Wrentham, . . .	552	22	13	315 00	1,067 50
Yarmouth, . . .	145	1	-	-	1,470 00
Total, . . .	212,601	8,969	{ 4,144 550 }	{ \$137,693 55 16,040 25 }	\$1,750,000 00

List of Towns that have sent in no Returns of Herd Inspections.

Clarksburg,	Halifax,	Nahant,
Essex,	Holbrook,	Oakham,
Florida,	Hyde Park,	Richmond,
Georgetown,	Manchester,	Rockland.
Gloucester,		

The law further provides that all cattle slaughtered upon the premises of the owner, other than a licensed slaughter house, shall be inspected at the time of slaughter, by the inspector, "unless said animal is less than six months old, or has been duly inspected under the provision of this act within six months prior to such slaughter, and a certificate of health has been delivered to the owner or person in charge thereof."

Under this provision the inspectors have reported the following work:—

Number of cattle inspected at time of slaughter, under section 21,	1,964
Number of sheep inspected at time of slaughter, under section 21,	355
Number of swine inspected at time of slaughter, under section 21,	3,050
Number of cattle inspected at licensed slaughter houses at time of slaughter,	102,693
Number of sheep inspected at licensed slaughter houses at time of slaughter,	301,939
Number of swine inspected at licensed slaughter houses at time of slaughter,	773,439
Total number of animals inspected at time of slaughter, including those inspected at licensed slaughter houses and also under section 21,	1,178,071

The following is the return by the inspectors of the number of carcasses condemned as diseased at the inspections at slaughter houses and on private premises:—

Cattle destroyed as tuberculous,	482
Sheep destroyed as tuberculous,	—
Swine destroyed as tuberculous,	91
Percentage of cattle found infected, . . . . .	.46
Percentage of sheep found infected,	—
Percentage of swine found infected, . . . . .	.0117

Under the law for the licensing and inspection of slaughter houses the following circular was issued:—

COMMONWEALTH OF MASSACHUSETTS.

BOARD OF CATTLE COMMISSIONERS,
52 VILLAGE STREET, BOSTON, July 1, 1896.

GENTLEMEN:—I beg to call your attention to sections 17, 18 and 22 of chapter 491 of the Acts of 1894, as amended by sections 3, 4 and 8 respectively of chapter 496 of the Acts of 1895, which are in general relation to the licensing of slaughter houses and all similar establishments, the products of which are to be sold or used for food. I will further call your attention to the following paragraph, which is a portion of the said section 18, as amended by the said section 4: “The board or officer of every city or town authorized to issue said licenses shall on or before the first day of June in each year send to the Board of Cattle

Commissioners a copy of every application made to them under section seventeen of this act, and shall state the doings of said board or officer upon said application; and shall further send to the Board of Cattle Commissioners the names and addresses of all persons required to make application under section seventeen, who were engaged in such business on the last day of the previous April, and who failed to make application as provided in said section."

I beg to state further that this Board has not, as yet, received the required notices from you in this connection, and to ask that they be sent without further delay. In answering, kindly give not only the required copy of any "application" that may have been made to you, together with a statement of your doings thereon, but also and particularly "*the names and addresses of all persons in your town required to make application under section 17, and who have failed to make application as provided in said section.*"

An early and full reply is earnestly desired.

Respectfully, CHARLES P. LYMAN, *Secretary.*

The following is the form issued for reports from city and town officials charged with the duty of licensing slaughter houses:—

COMMONWEALTH OF MASSACHUSETTS.

RETURN OF LICENSED SLAUGHTER-HOUSES.

CITY or TOWN of _____ MAY, 189 .
To the Board of Cattle Commissioners for the Commonwealth of Massachusetts.

GENTLEMEN:—In accordance with the provisions of section 18 of chapter 491 of the Acts of the year 1894, as amended by section 4 of chapter 496 of the Acts of the year 1895, we submit the following statement in relation to slaughter-houses within the limits of our city or town.

The names of all persons licensed to carry on the business of slaughtering for the following year, a copy of whose application for a license is sent herewith, are as follows:—

NAME.	Address.	License Issued.*	Application Denied.*

* See note on page 26.

The names and address of all persons required to make application, who were in business on the last day of April last past, failing to make application, are as follows : —

NAME.	Address.	Licensed Last Year?*	Remarks.

Board or Officer authorized to issue such licenses.

* NOTE. — Please fill up all blanks as far as possible, stating in each case “yes” or “no” as to whether a license has issued, and as to whether the person was licensed the previous year.

INSPECTION OF STABLES.

A large amount of work has been accomplished during the year in the examinations of barns and stables in reference to their sanitary conditions, and the Board is pleased to report that, in response to its advice and suggestions in former reports, there has been quite a marked improvement in this respect. Especial attention has been paid to the relations of manure in cellars, bad ventilation and impure water to the health of animals and the purity of the milk supply.

In accordance with the demands of section 4, chapter 491, Acts of 1894, as amended by section 1, chapter 496, Acts of 1895, the Board sent out the following blank for a return of the inspection and examination of different premises throughout the Commonwealth : —

REPORT OF AN INSPECTION AND EXAMINATION OF THE PREMISES IN WHICH THE ANIMALS BELONGING TO MR. OF ARE KEPT.

[Made in accordance with the demands of section 4 of chapter 491 of the Acts of 1894, as amended by section 1 of chapter 496 of the Acts of 1895.]

Material of building? Length of stable? Width of stable?
Width from mangers or “tie ups” to wall behind animals?
Height from floor to ceiling?
Number of windows facing north? Size of sash?
Number of windows facing east? Size of sash?

Number of windows facing south? Size of sash?
 Number of windows facing west? Size of sash?
 Is the stable open or closed in front of animals?
 Is the stable well lighted?
 Is the stable in a basement or cellar?
 Is the stable kept clean? What is done with the manure?
 Is there a cellar under barn?
 Is the cellar open or closed?
 Does the air in the stable seem good, or is it heavy or bad smelling?
 Is the stable warm or cold? How is the stock watered?
 If from well, give its location in regard to barn cellar, manure yard or any other source of possible contamination?
 Is soil under building dry, or wet?
 Is it gravel, sand, clay, or rock?
 Are animals in a thrifty or unthrifty condition?
 Is the stock kept well cleaned?

189 .

Inspector.

From the returns of the above inspection, sent to this office, the following tables have been compiled:—

Total number of stables inspected, . . .	24,161
of stables on the ground, . . .	9,358
of stables over cellars, . . .	12,594
of stables in cellars, . . .	2,209
of stables with good light, . . .	15,371
of stables with bad light, . . .	6,590
of stables with no light, . . .	2,200
of stables with good ventilation, . . .	19,981
of stables with bad ventilation, . . .	3,217
of stables with no ventilation, . . .	963
of stables with good water supply, . . .	9,083
of stables with fair water supply, . . .	12,511
of stables with bad water supply, . . .	2,567

Taking all these details into consideration, we classify the barns and stables inspected as follows:—

	Per Cent.
In good condition,	56
In fair condition,	36
In bad condition,	8

List of Towns that have sent in no Returns of Inspection of Stables.

Amesbury,	Greenwich,	North Attleborough,
Brookline,	Halifax,	North Reading,
Bradford,	Heath,	Northbridge,
Billerica,	Holbrook,	Oakham,
Burlington,	Holden,	Pittsfield,
Clarksburg,	Hyde Park,	Provincetown,
Colrain,	Holyoke,	Richmond,
Conway,	Hampden,	Rockland,
Dedham,	Leverett,	Russell,
Dover,	Lincoln,	Rutland,
Danvers,	Littleton,	Sandisfield,
East Longmeadow,	Manchester,	Sheffield,
East Bridgewater,	Marlborough,	South Hadley,
Erving,	Marshfield,	Sherborn,
Essex,	Montville,	Springfield,
Florida,	Natick,	Wareham,
Framingham,	Needham,	Ware,
Freetown,	New Ashford,	Wellesley,
Gardner,	New Salem,	Winthrop,
Georgetown,	Newbury,	Wilmington,
Gloucester,	Newton,	Woburn.
Gosnold,	Norfolk,	
Greenfield,	North Adams,	

The laboratory work, in connection with reports on hygienic conditions of barns, has been conducted similarly to last year, with a few important exceptions, which it may be well to note.

The carbonic acid determination was made a year ago, by means of the apparatus devised by Professor Fitz of the Lawrence Scientific School for testing air of school-rooms, and, while of course not absolutely correct, yet approximate results were easily obtained, comparable with one another and accurate enough for all purposes of our investigation. This has been omitted in this year's work, as, to obtain satisfactory results, it was necessary for an agent of the Board to spend a night in the town, and visit the barns by the time they were first opened in the morning. This limited the examinations which one man could make to about two per day, and entailed comparatively heavy travelling expenses. This year, also, a part of the investigation has been left to the local inspectors, so that one agent can visit two or three towns and make six or eight examinations per day.

The estimation of bacteria in the air has likewise been left out of this report, partly for reasons similar to those just given under the carbonic-acid determination, and more particularly because the results were not satisfactory, and in many cases we believe not reliable, as obtained by our method of 1895.

During the year reports have been sent to the Board, from various inspectors, as to the sanitary conditions existing in some places, which seemed to call for special investigation. All such reports are looked into as soon as possible, and, if found to be well grounded, the local boards of health are notified, after which no further action has been taken, as the intention is not to interfere in any way with any person or public board, but simply to improve to a great extent conditions which are recognized as dangerous not only to the individuals using the impure water, but in some cases to the entire community, as was case No. II., for the month of October, 1895.

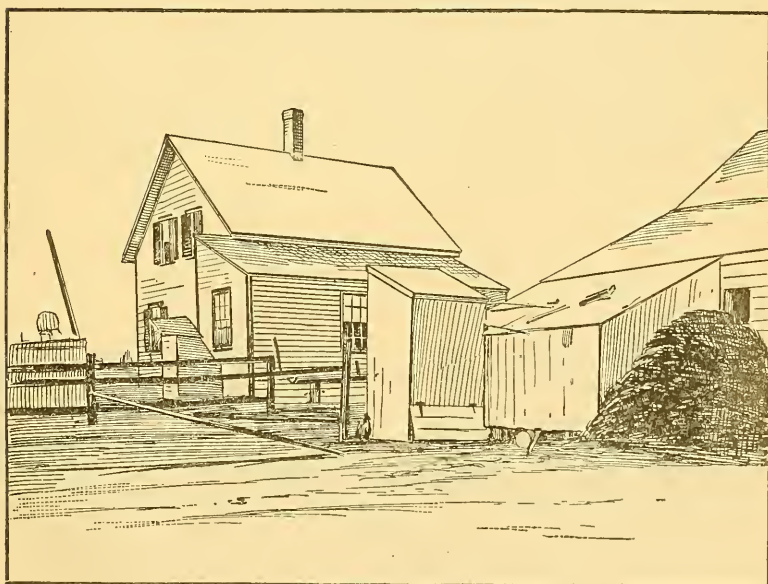


FIGURE NO. 1.

This case is illustrated (Figure 1) where we see the well at the end of the house (between two lower windows); the

privy between well and barn, and a large manure heap on the extreme right, which has been thrown from the little

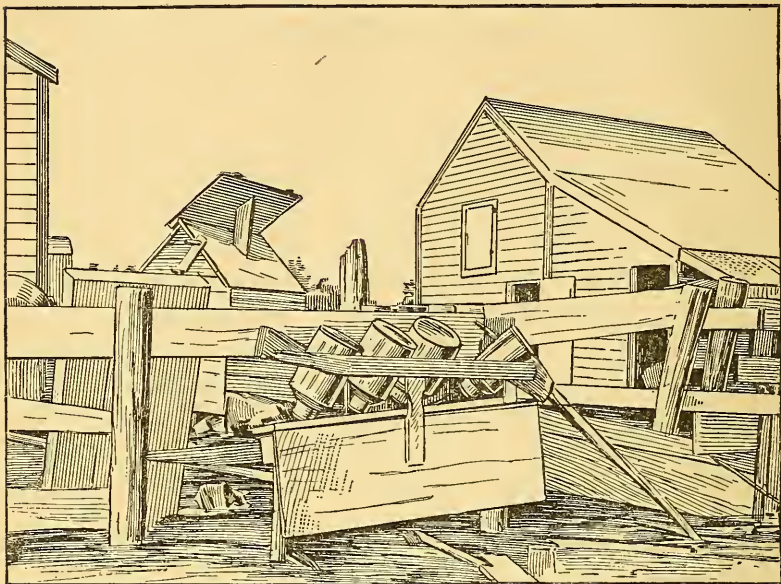


FIGURE No. 2.

square window appearing just above it in the side of the barn. An additional source of contamination, which the picture

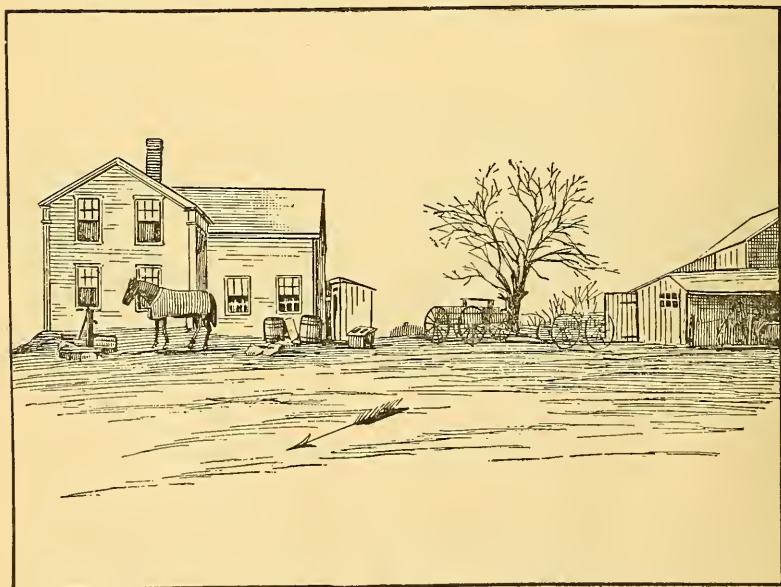


FIGURE No. 3.

does not show, is a sink drain, which runs out on top of the ground just under the back window. From the well to the manure heap is perhaps forty feet.

Figure 2 shows the same house (on the left), the barn (on the right), and a view of the well with the milk cans draining behind it. The water from the well was found upon analysis to be contaminated by a very large amount of organic impurity, the very high chlorine showing it to be of animal origin.

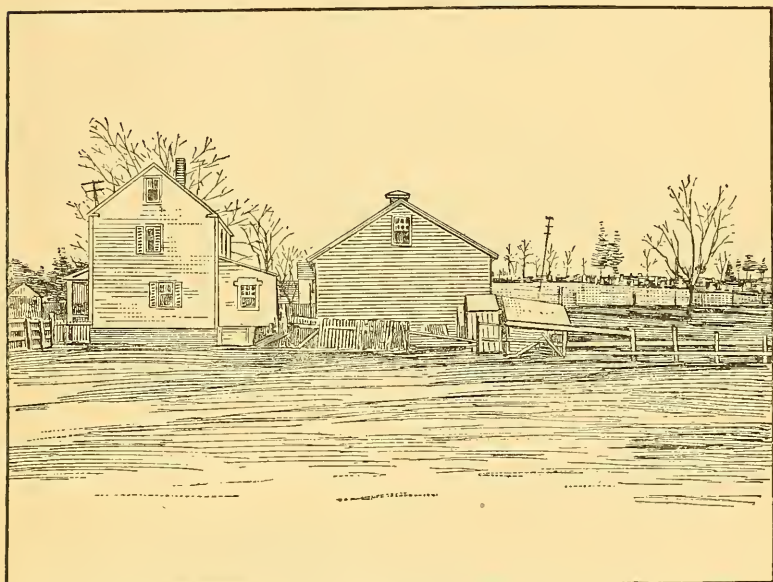


FIGURE No. 4.

Figure No. 3 is of a well (directly before the horse) which received the drainage of such buildings as the picture shows, also a very filthy pig pen, concealed by the door of the shed. The owner claims that a ledge runs a few feet under the surface, in the direction of the arrow. This is probably true, and the conditions give but very slight opportunity for filtration and consequent oxidation of sewage before it reaches the well.

Figure 4 is another of the cases to which the attention of the Board has been called by the local inspector. The barn, forty by forty feet, is all open inside. No particular place

for animals, — one horse, three cows, two calves and thirty-eight hogs have a picnic together. Situated on land under water five months in the year. Sickness in the family with typhoid fever existed during the year.

The well is a few rods distant on the other side of the barn, and an analysis of the water, while showing contamination, is far better than would at first be supposed. This is due to the character of the soil through which the water runs.

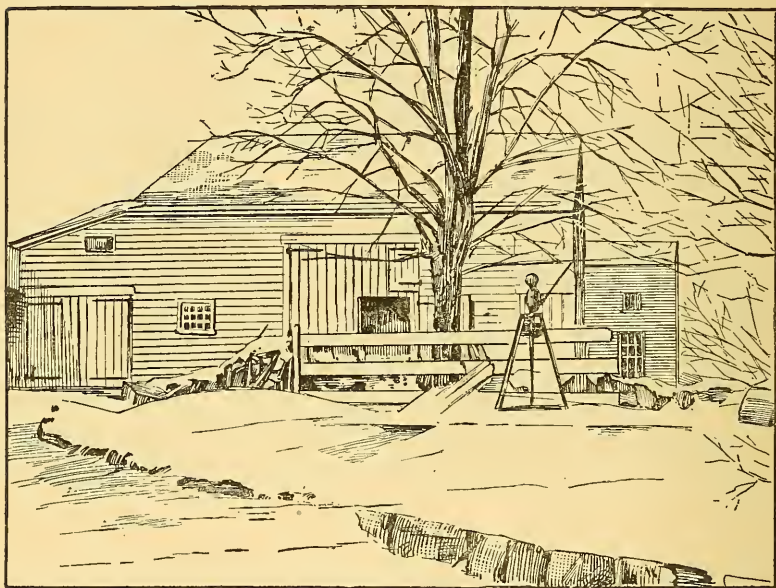


FIGURE NO. 5.

Figure No. 5 shows another case in which the water was found to be badly contaminated. The well (under tree in foreground) is so situated that it receives the drainage from the barn, which contains fourteen cattle. The water is obtained from a pump in the barn behind the horse stall, the pipe from which runs through the manure heap in the barn cellar. This water comes from the well shown in the picture, and contamination is present in a marked degree, as shown by chemical analysis.

*Summary of Laboratory Reports on Hygienic Conditions of Barns
inspected during November and December, 1896.*

No.	TOWN.	Date (1896.)	Number of Animals.	Cubic Feet of Air Space per Head.	Condition of Ventilation	Condition of Water.
1	Waltham, . .	Nov. 12	7	2,000	Fair,	Contaminated.
2	Waltham, . .	" 12	14	860	Poor,	Very bad.
3	West Bedford, .	" 24	9	1,600	Fair,	Slight contamination.
4	Bedford, . .	" 24	18	1,500	Good,	Good.
5	Sudbury, . .	" 25	22	980	Fair,	Slight contamination.
1	Norwood, . .	Dec. 1	-	-	Fair,	Contaminated but well filtered.
2	Lexington, . .	" 2	19	2,500	Good,	Contaminated.
3	Watertown, . .	" 8	14	1,500	Good,	Slight contamination.
4	Watertown, . .	" 8	13	620	Fair,	Fair.
5	Watertown, . .	" 8	3	330	Fair,	Slight contamination.
6	Watertown, . .	" 8	37	800	Good,	Fair.
7	Rowley, . .	" 9	4	770	Fair,	Slight contamination.
8	Rowley, . .	" 9	8	1,600	Fair,	Fair.
9	Rowley, . .	" 9	3	2,500	Fair,	Fair.
10	Rowley, . .	" 9	12	750	Poor,	Very bad.
11	Rowley, . .	" 9	12	1,200	Good,	Good.
12	Rowley, . .	" 9	12	800	Fair,	Good.
13	Newburyport, .	" 9	44*	540	Fair,	Slight contamination.
14	Newburyport, .	" 9	2	-	Fair,	Dangerous.
15	North Billerica,	" 11	20	1,000	Fair,	Slight contamination.
16	Billerica, . .	" 11	17	2,200	Fair,	Fair.
17	Billerica, . .	" 11	15	800	Fair,	Slight contamination.
18	Billerica, . .	" 11	8	1,600	Fair,	Bad.
19	Billerica, . .	" 11	27	700	Good,	Good.
20	East Billerica, .	" 11	5	1,000	Poor,	Fair.

The figures given for some of the barns in Billerica are estimates made by the agent, as the inspector's returns were not made in season for use in this report.

WORK AT THE PUBLIC MARKETS.

The work of the Board at the public cattle markets at Brighton, Watertown and Somerville has been constant during the year, and has occupied much of the time of one of its members. The work has included the identification

* Thirty-eight hogs.

and release of animals from without the State, that came in with certificates of soundness from approved veterinarians or that came in for immediate slaughter, and the testing of such cattle as are brought from without the State without certificates.

Besides this, the reception and slaughter and post-mortems upon cattle sent from all over the State by local inspectors, after condemnation by the Board, has consumed much time and careful attention. It has been found advisable to have nearly all this work done at Brighton, rather than to send an agent to each farm where diseased cattle are found, kill them and pay for their proper burial.

Under the present system all the work is superintended by a member of the Board, and the carcasses bring a considerable revenue from the rendering establishment. During the year this method has proved sufficient to pay all expenses incident to shipping, driving and slaughtering the cattle, cleaning and disinfecting the cars, etc., and have a balance of \$2,783.36, which has been turned into the State treasury. A larger advantage is the fact that the Board is certain as to the disposal of the infected carcasses. The number of such cars arriving at Brighton during the year is 144, and at Watertown 83.

The work of cleaning and disinfecting these cars has absorbed considerable time. A small boiler and steam pump are used, and the disinfectant is heated and thrown into each car with a jet of live steam, thus reaching every part, and removing any germs that may be present.

Animals coming without certificates have been held in quarantine for at least six days, and then subjected to the tuberculin test. The holding of these animals for at least six days before testing, to allow of their return to a normal condition after the fever-inciting experiences of travel, has proved that the unfortunate experiences with the tuberculin test at these markets earlier in the work of this Board were almost wholly due to the application of the test immediately after the arrival of the animals. Under the longer quarantine before test the results have been quite satisfactory.

Under the arrangement entered into with the Cattle Commissioners of the adjoining States, nearly all the cattle sent from without the State to the public markets at Brighton,

Watertown and Somerville have been tested by approved veterinarians before entering the State. However, 501 animals have appeared at these markets without certificates of test. Of these, 18 were found diseased with tuberculosis, and were destroyed, and 5 others were condemned as affected with actinomycosis.

The details of the work at the several markets are as follows:—

Report of Stock received at Brighton from Dec. 15, 1895, to Dec. 15, 1896.

Maine cattle,	7,951
New Hampshire cattle,	2,639
New York cattle,	448
Massachusetts cattle,	6,900
Western beef,	18,879
Sheep,	74,449
Calves,	18,510
Hogs,	43,068
Cattle released on certificates,	7,781
Cattle tested,	200
Cattle released after test,	197
Cattle condemned after test,	3
Cattle retested at abattoir,	395
Cattle condemned at abattoir after retest,	395

Report of Stock received at Watertown from Dec. 15, 1895, to Dec. 15, 1896.

Vermont and New Hampshire cattle,	7,487
Massachusetts cattle,	1,793
New York cattle,	675
Western beef,	139,285
Northern beef,	5,354
Sheep,	357,899
Calves,	47,079
Hogs,	1,340,939
Cattle released on certificates,	8,162
Cattle tested,	211
Cattle released after test,	199
Cattle condemned after test,	12

Report of Stock received at Somerville from Dec. 15, 1895, to Dec. 15, 1896.

Western beef,	49,455
Vermont and New Hampshire cattle,	436
Massachusetts cattle,	257
Sheep,	413,876

Calves,	49,671
Hogs,	12,904
Cattle released on certificates,	436
Cattle tested,	90
Cattle tested and released,	87
Cattle tested and condemned,	3
Cattle condemned, actinomycosis,	5

Recapitulation.

Total amount received at the three stations:—

Total number of cattle,	241,559
Total number of sheep,	846,224
Total number of calves,	115,260
Total number of hogs,	1,396,911
Total number released on certificates,	16,379
Total number tested at stations,	501
Total number released at stations,	483
Total number condemned at stations,	18
Total number condemned for actinomycosis,	5

Aside from the stock brought into the State on veterinarians' certificates for the purpose of sale at the public markets, permits were issued to parties desiring to import animals to replenish their own stables, or to return animals owned here but pastured without the State during the season. The amount of this work has been as follows:—

*Report of the Number of Cattle brought into the State on Permits,
from Dec. 15, 1895, to Dec. 15, 1896.*

Dec. 15 to 31, 1895,	390
January, 1896,	532
February, 1896,	302
March, 1896,	359
April, 1896,	343
May, 1896,	203
June, 1896,	411
July, 1896,	407
August, 1896,	411
September, 1896,	825
October, 1896,	945
November, 1896,	1,681
December 15, 1896,	409
Total,	<hr/> 7,218

The total number of permits for these cattle was 569.

GLANDERS.

During the past year the Board has had 384 horses reported as suspected of being affected with glanders. The cases reported and their location are as follows : —

TOWN.	Number of Animals.	TOWN.	Number of Animals.
Arlington,	1	New Bedford,	4
Beverly,	1	Newton,	5
Billerica,	1	Northampton,	2
Blandford,	1	North Andover,	1
Boston,	108	Northborough,	1
Brockton,	1	North Brookfield,	1
Cambridge,	13	Quincy,	3
Charlestown,	15	Rowe,	1
Chelsea,	4	Randolph,	1
Clinton,	1	Salem,	1
Cohasset,	1	Sandisfield,	1
Dartmouth,	1	Saugus,	2
Dedham,	5	Scituate,	1
Easton,	2	Somerville,	9
Everett,	2	Southampton,	1
Fall River,	21	Southborough,	1
Framingham,	1	Springfield,	4
Grafton,	2	Stoneham,	3
Greenfield,	1	Taunton,	4
Hardwick,	1	Upton,	1
Holyoke,	3	Waltham,	1
Hyde Park,	2	Watertown,	1
Leicester,	1	Webster,	1
Lexington,	2	Wellesley,	1
Longmeadow,	1	Wenham,	2
Lowell,	2	Westborough,	1
Lunenburg,	1	Westfield,	7
Lynn,	3	Westford,	1
Malden,	6	West Springfield,	1
Marlborough,	1	Winchester,	1
Medford,	1	Worcester,	100
Millbury,	1	Wrentham,	1
Milford,	2	Yarmouth,	1
Needham,	5	Not given,	4

Of this number, 341 were either condemned as diseased, or killed at the request of the owner.

The statistics show an increase in the disease in the State the past year; but this fact is probably practically due to a better understanding of the law relating to it rather than to any absolute increase in the number of cases. Formerly many cases were handled by veterinarians or by owners, and killed without any report being made. As the public has become aware of the requirement of the statute, that all such cases must be reported to this Board, the list of cases has steadily increased.

In the opinion of the Board, it is quite practicable to largely reduce the prevalence of this disease, as local inspectors and boards of health become better acquainted with their duties, and come to a full appreciation of the importance of active observance of the law in regard to the reporting of cases. Much can also be done to restrict the disease, if reasonable precautions are observed by owners. The watering of horses at public troughs, the hitching to public posts and stabling in places of doubtful safety are all ready means for transmitting infection.

RABIES.

On or about Dec. 10, 1895, there were reports of the appearance of several dogs apparently affected with rabies in the vicinity of Boston. Careful investigation was made of the reported cases, and, it appearing that there was reason to fear an extension of the trouble unless prompt measures were taken, the Board issued the following order of quarantine:—

COMMONWEALTH OF MASSACHUSETTS.

BOARD OF CATTLE COMMISSIONERS,
52 VILLAGE STREET, BOSTON, JAN. 23, 1896.

To the Cities and Towns of Newton, Cambridge, Watertown, Belmont, Somerville, Arlington, Medford, Malden, Everett, Chelsea and Revere, the Boards of Health within the Same and All Persons whom it may concern:—

Whereas, Rabies, a contagious disease under section 37 of chapter 491 of the Acts of the year 1894, has appeared among certain domestic animals, to wit, dogs, in certain portions of this Commonwealth; and

Whereas, The Board of Cattle Commissioners of said Commonwealth is authorized, under the provisions of sections 38, 39 and 40 of said chapter 491, to make orders and regulations concerning the extirpation, prevention and suppression of contagious diseases among domestic animals ; and

Whereas, The Board of Cattle Commissioners is of the opinion that there is danger of the further extension of said disease, and that the public exigency requires that steps be taken to prevent the further spread of said disease and to suppress the same as far as possible ;

Now, therefore, we, the Board of Cattle Commissioners for the Commonwealth of Massachusetts, by virtue of the power and authority in us vested by law, have adopted and do hereby issue the following order :—

General Order No. 11.

First.—The cities and towns of Newton, Cambridge, Watertown, Belmont, Somerville, Arlington, Medford, Malden, Everett, Chelsea and Revere are hereby declared to be infected districts and are hereby made subject to the regulations hereinafter imposed.

Second.—No dog shall be permitted to go at large within the limits of any of said cities or towns unless such dog is securely muzzled with a properly fitting wire muzzle. All said dogs shall remain so muzzled for a period of ninety days from Jan. 23, 1896.

Third.—The boards of health of the cities and towns herein named are hereby ordered and directed to see that this order is strictly complied with within the limits of their respective cities and towns, and they are hereby directed to cause every dog found at large, contrary to the orders herein contained, to be seized and securely confined in some suitable place to be by them selected, and not to permit said animal to go at large thereafter, except in compliance with this order. Each of said boards is further ordered to safely quarantine all animals within the limits of their city or town suspected of being affected with rabies, and to immediately report the same to this Board, in accordance with said chapter 491.

Fourth.—No person within the limits of said cities or towns shall, during the continuance of this order, permit any dog owned by him, or which is within his possession or control, to go at large within the limits of any of said cities or towns, unless said dog is at all times securely muzzled as hereinbefore provided. The leading of dogs through the streets by a leash or chain, unless so properly muzzled, is hereby forbidden.

Fifth.—Every person who has knowledge of or has reason to suspect that any dog within any of said cities or towns is affected with or has been bitten by an animal affected with rabies, whether this knowledge is obtained by personal examination or otherwise, shall immediately give notice of the fact to the Board of Health of the city or town where such dog is kept.

Sixth. — Each city and town herein mentioned shall cause a copy of this order to be published once at least in a daily newspaper published in said city or town. If no such paper is so published, then by posting a copy of this order in two or more public places within the limits of said city or town.

Seventh. — This order shall take effect upon the twenty-third day of January, 1896.

FREDERICK H. OSGOOD, *Chairman*,
 CHARLES P. LYMAN, *Secretary*,
 MAURICE O'CONNELL,
 LEANDER F. HERRICK,
 CHARLES A. DENNEN,
Board of Cattle Commissioners.

This action was criticised as arbitrary and unnecessary by a portion of the community affected, but the result justified the action, for, while isolated cases, fairly traceable to those first reported, did appear, the public was on its guard, and no generally serious consequences followed.

The following is the full list of cases reported to the Board during the year : —

DATE.	Town.	Number of Cases
January 6,	Waltham,	1
January 21,	Revere,	1
February 21,	Hardwick,	1
February 29,	Chelsea,	1
March 1,	Haverhill,	1
March 14,	Lowell,	1
March 18,	Salem,	1
April 1,	Boston,	1
April 14,	Haverhill,	1
May 16,	Cambridge,	1
June 12,	Lynnfield,	1
July 23,	Cambridge,	1
November 9,	South Hadley,	1
November 27,	South Hadley,	1
December 3,	Haverhill,	1
December 18,	Boston,	1
Total, . . . .	. . . .	16

HOG CHOLERA.

While this State has been comparatively free from hog cholera and swine plague, diseases which resemble each other so closely that only post-mortem examination and the use of the microscope can be relied upon with certainty to determine their individual character, — they are in other sections of this country the cause of the loss of millions of dollars every year to the farmers.

The Bureau of Animal Industry, in charge of Dr. D. E. Salmon, at Washington, has issued important bulletins, in which it is stated that the symptoms of the two diseases and their effect are quite similar, and that both are caused by bacteria. They must, therefore, be met by preventing the infection of the premises, the destruction of the germs wherever they have found lodgement, the treatment of the sick animals to reduce the fever, stopping the propagation of the germs, and the careful disposition of the bodies of the animals dying from the disease. The treatment of the two diseases is essentially the same.

Young animals are especially susceptible to the diseases, the older ones seeming to have a greater power of resisting infection. It is also believed that animals once slightly affected, and recovered, are, to a large extent, immuned from subsequent infection, while fresh animals placed in the same pens are infected by the germs remaining from the original cases. The germs are tenacious of life, and infection may result from their presence in food or drink, or in the air. After infection the disease develops in from four to twenty days. In acute cases animals die suddenly, often before their illness has been observed, but more often there is a longer period in which to observe the progress of the disease.

The usual symptoms are fever, shivering, torpidity, loss of appetite, a temperature rising to 106° or 107° F., exhausting diarrhoea, an exudation of a thick secretion from the eyes, quick, labored breathing, cough, a redness of the skin, a crusty eruption, and loss of strength and of flesh until the end.

The indications of hog cholera by post-mortem examination are : —

1. Hemorrhages, particularly in the subcutaneous, submucous and subserous connective tissues; in the lymphatic glands and in the various organs of the body.

2. Ulcerations of the large intestines.

3. Collapse of lung tissue, and less frequently bronchopneumonia.

The most characteristic lesions of swine plague are: —

1. Inflammation of the lungs; numerous small necrotic points in these organs, or a few large cheesy masses.

2. Inflammation of the serous membranes, with fibrinous deposits.

3. Congestion of the mucous membrane of the intestine, or inflammation of the same, with fibrinous deposits.

Experts do not yet agree as to the certainty of remedies, but Dr. Salmon says: —

The most efficacious formula which has been tried is the following: —

	Pounds.
Wood charcoal,	1
Sulphur,	1
Sodium chloride,	2
Sodium bicarbonate,	2
Sodium hyposulphite,	2
Sodium sulphate,	1
Antimony sulphide (black antimony),	1

These ingredients should be completely pulverized and thoroughly mixed. The dose is a large tablespoonful for each two hundred pounds weight of hogs to be treated, and it should be given only once a day. They should have at least once a day soft feed, made of mixed bran and middlings, or middlings and corn meal, or ground oats and corn, or crushed wheat with hot water, and then stirring into this the proper quantity of medicine. Animals that will not come to the feed should be drenched with the medicine shaken up with water. Great care should be exercised in drenching hogs, or they will be suffocated. Do not turn the hog on its back to drench it, but pull the cheek away from the teeth so as to form a pouch, into which the medicine may be slowly poured. It will flow from the cheek into the mouth, and when the hog finds out what it is, it will stop squealing and swallow.

This medicine may also be used as a preventive of these diseases, and for this purpose should be put in the feed of the whole herd. Care should of course be observed to see that each animal receives its proper share. The animals should be kept dry and comfortable, and where draughts of air will not blow upon them. The food must be such as can be digested by the irritated and inflamed organs.

When the hogs are first found to be affected, the lot or the pens should be disinfected by dusting plentifully with dry, air-slaked lime, or by sprinkling with a five per cent. solution of crude carbolic acid. The animals should then be all removed to new quarters. If possible, the sick and apparently well should be separated before they are moved, and then put into different lots. The hogs should be kept in dry lots or pens, where there is no mud, and; above all, no stagnant water. It is well to keep these lots disinfected by the free use of air-slaked lime or carbolic acid.

If any hogs die during the progress of the outbreak, their carcasses should be immediately burned or deeply buried, and the places where they have lain, or the ground over which they are dragged, should be disinfected with carbolic acid or lime, according to the method already mentioned.

When these diseases appear upon a neighboring farm, precautions should be adopted to prevent the introduction of the contagion. No one should go upon the fields or into the pens where the sick animals are, and then go into another farm where the disease has not appeared. Remember that a particle of manure or dirt the size of a mustard-seed from an infected farm is sufficient to start an outbreak that will destroy a herd of swine. A particle of that size may be carried upon the shoes of a visitor, upon the foot of a dog or other animal, upon a wagon wheel or in a multitude of other ways. Non-intercourse at such times is, therefore, the safest rule. It is advisable, when there is reason to fear this disease, to keep the hogs in a small enclosure, which should be as dry as possible, and disinfected once a week with air-slaked lime or a five per cent. solution of carbolic acid. A small quantity of carbolic acid (three to fifteen drops, according to age) in the drinking water tends to prevent infection, and may have a beneficial influence upon the course of the disease.

Hog cholera has been reported to the Board during the year as follows:—

TOWN.	Number of Cases.	Number of Animals.
Adams,	1	13
Billerica,	1	24
Dalton,	2	8
Hanover,	1	1
Holyoke,	2	24
Ludlow,	2	12
Merrimac,	1	3
Plymouth,	1	1
Sherborn,	1	2
Westfield,	3	6
Westminster,	1	1
Total,	16	95

LABORATORY REPORT.

The following is a report of the work in the laboratory of the Board during the year:—

To the Board of Cattle Commissioners, Boston, Mass.

GENTLEMEN:—We herewith submit a report of the work done in the laboratory under the direction of the Board for the year 1896. It has consisted of the examination of specimens, which have been sent by inspectors and others, of doubtful cases of disease, where a careful and microscopic examination was needed; of experimental work and of the chemical analysis of water and sanitary inspection of premises.

There have been about two hundred specimens examined, which are classified in Table I.

Tuberculosis shows the largest number, as the work has been mainly directed to that during the year. The most interesting cases were those where a very minute lesion was found in cattle that had given a high reaction, and emphasizes the necessity of a thorough examination of every gland before placing the case among those in which the test failed. This confirms the experience of last year.

Swine are the next greatest sufferers from the disease; while the samples from sheep, hens or dogs have not shown any positive evidences, and, although its existence among these animals is not denied, its spontaneous occurrence must be regarded as a great

rarity in this State. On account of the tendency to early calcification of the cheesy masses, the bacilli are found with great difficulty, and in all doubtful cases inoculation was resorted to as a means of diagnosis.

Experiments were tried to inoculate hens with tuberculous material from both cattle and swine, but there was not the slightest evidence of infection after many months. This is in accordance with the observation of others, and is a strong argument in favor of regarding the bacillus of avian tuberculosis as certainly a variety, if not a distinct species, from that of the mammalian. Its manner of growth in pure culture also confirms this view. Its casual relation, therefore, to human tuberculosis, must still be regarded as under judgment.

Experiments in the inoculation of calves with human tuberculous sputa were carried out by Dr. Langdon Frothingham, who makes a special report on this work.

The conditions which are the most frequently confounded with tuberculosis are those due to actinomycosis, œsophagostoma and fatty infiltration of the liver.

Actinomycosis (lump-jaw), a new growth due to a polymorphous bacillus, is usually situated on the ramus of the lower jaw, but occasionally attacks other parts of the head and the lungs. The tissue to the eye appears of the uniform pale-grayish color, usually dotted with small holes, from which pus can be squeezed, containing small yellowish granules (masses of the bacilli, actinomycetes). When abscesses are formed in the lung, the pus is very tenacious and stringy, looking more like very thick mucus, and has in it the same little bodies.

Æsophagostoma Columbianum, a small round worm, produces a nodular disease of the intestine in sheep and cattle. The little tumors, which may be mistaken for tubercles, are situated in the wall of the intestine, sometimes projecting into the gut and at other times more prominent on the outside. They are gritty, and when cut open are found to contain a dry, greenish material, which at once distinguishes them from the products of the tubercle bacillus, which are yellow, cheesy and calcified.

Fatty Infiltration of the Liver.—Often a small area of the liver stands out in striking contrast to the dark-brown color of the rest of the organ, by its opaque color. This is due to a local infiltration of the liver cells with fat. From early tuberculosis it is distinguished by the sharp outline against the neighboring tissue and by the absence of any evidence of inflammatory action, in the way of increased redness, about it, or of any tendency to calcification.

Experiments were carried on last year with Klebs' antiphthisin

as a curative agent, with negative results. Tests are now being made with aseptolin (Edson), protonuclein, both hypodermically administered; and guaiacol carbonate, given internally; but as yet it is too early to give the results.

Glanders. — As an aid to diagnosis in doubtful cases, the inoculation of guinea pigs has been made. The discharge from a suspicious ulceration was collected on a swab of absorbent cotton, and this was then carefully washed out in a little distilled water and injected into the peritoneal cavity with a subcutaneous syringe. If the bacilli of the disease were present, an inflammation of the peritoneum was set up, characterized by the presence of small granulations on the surface, with fibrinous exudation. This readily extended to the tunica vaginalis in the males, causing a marked swelling in the region of the testicle that could be readily recognized externally. The process required from three to six days for its development.

As can be readily understood, the bacilli may be absent in the discharge, and therefore a negative result cannot be absolutely relied upon to exclude the disease. But it is a distinct aid in doubtful cases, and should always be employed. Six cases were examined; in two it gave a positive result, in three a negative one, confirming the diagnosis, and in one it was at fault, as the case was a clear one from the clinical side.

Rabies. — The existence of an epizootic of this disease was confirmed by the results of inoculations. As is well known, there are no changes in the body by which the existence of this disease can be absolutely shown, and, although the presence of foreign material (straw, hair, bits of wood, etc.) in the otherwise empty intestine of a dog that has acted strangely, or furiously, is strongly presumptive evidence, still it can only be surely established by the transmission of the disease to some other animal. This was done upon rabbits, after Pasteur's method.

Twenty-five suspected animals have been received during the past year for examination: of these, thirteen gave a positive result; of the remaining twelve, one was too much decomposed to be used, two showed evidence of other disease (broncho-pneumonia, meningitis), from two the rabbits died from sepsis, four gave clearly a negative result and three are still under observation. The time of incubation in the positive cases varied from six to ninety-one days. The larger number showed symptoms between the fourteenth and eighteenth day. The details are given in Table II.

From these observations, which are in accord with those the world over, a given case cannot be declared negative until at least after three months have elapsed from the time of inoculation. If any means can be devised by which a certain diagnosis can be

arrived at in a short time, it will be a great step in advance. Keirle ("New York Medical Journal," Vol. 60, page 27) has suggested the use of mice for this purpose, claiming, from the results of his experiments, that a few drops of fluid, in which was suspended a little of the brain of a rabid animal, inoculated at the root of the tail, produced the disease in from seven to eleven days. Upon study of his work it was found that he had only used material coming from experimental animals, in which the virus was tolerably constant. It was deemed advisable, therefore, to try it in the ordinary cases of street rabies, as they came to the laboratory. In this work I was kindly assisted by Dr. Langdon Frothingham. The results of our work can be briefly stated as follows:—

As a rule, the mice died more quickly than the rabbits, but there were marked exceptions to this. The symptoms were by no means as clear, and were often only of a few hours' duration before death. When this is taken into account, with the liability of such quick-moving little animals to escape, and the difficulty of identification, they were found to be practically of no advantage over rabbits.

Another series of experiments had in view the isolation of the virus. It has never been clearly shown what this is, and, although there are many reasons which render it probable that it depends upon the action of the bacteria, still, none have ever been shown that can reproduce the disease. It has, therefore, suggested itself that the poison may be of the nature of a chemical ferment; and an attempt was made to obtain this by means which should exclude the possible action of bacteria.

The brains of two rabbits which had died from rabies were divided into four equal parts and allowed to macerate for about four days in a cold place, as follows: No. I., in ether; No. II., in a mixture of ether 65, alcohol 15 and chloroform 20 parts; No. III., in benzole; No. IV., in rhigolene. These extracts were then passed through a Pasteur filter, to remove any bacteria that might have been in the original brain substance; the ethereal and other solvents were removed by careful evaporation in vacuo at a low temperature, and towards the end of the process a little sterilized water was added, to prevent complete desiccation, which it is well known destroys the virus. From each of the four extracts a considerable residue was thus obtained. Distilled water to the amount of about 10 cubic centimeters was added to each, and the substance, as finely divided as possible by breaking up with a glass rod, was suspended in it.

Two rabbits were inoculated in the usual way from each of the three mixtures, with the following results: No. I. A rabbit dies

TABLE II. — *Inoculation for Rabies.*

DESCRIPTION OF ANIMALS.	Town.	Inoculated.	Rabies, First Symptom.	Days Elapsed.
		1896.	1896.	
C. C. 432, Newfoundland dog, (a) .	Waltham, . .	Jan. 6,	Jan. 20,	14
455, poodle,	Revere, . . .	Jan. 21,	Feb. 4,	15
489, setter,	Hardwick, . .	Feb. 21,	Mar. 11,	19
494, black and tan, . . .	Chelsea, . . .	Feb. 29,	Mar. 15,	15
- - - -	Haverhill, . .	Mar. 1,	Mar. 15,	14
503, collie,	Lowell, . . .	Mar. 14,	June 11,	89
509, spaniel,	Salem,	Mar. 18,	April 2,	15
spaniel,	Boston, . . .	April 1,	July 1,	91
532, dog,	Cambridge, . .	May 16,	June 26,	41
horse,	Haverhill, . .	April 14,	June 19,	63
545, dog,	Lynnfield, . .	June 12,	July 7,	25
565, cat,	Cambridge, . .	July 23,	Aug. 1,	7
611, whippet,	South Hadley, .	Nov. 9,	Nov. 23,	14
631, mongrel,	South Hadley, .	Nov. 27,	-	-
632, pug,	Haverhill, . .	Dec. 3,	-	-
dog,	Boston, . . .	Dec. 18,	-	-

Respectfully submitted,

WM. F. WHITNEY, M.D.

H. CARLTON SMITH, Ph.G.

BOSTON, MASS., Dec. 31, 1896.

To the Board of Cattle Commissioners, Boston, Mass.

GENTLEMEN:—I have the honor to submit herewith a condensed report on the experimental inoculation of calves with the human tubercle bacillus. These experiments the commission was kind enough to permit me to undertake in the winter of 1895 and the spring of 1896. I assume the liberty of sending you a condensed rather than a detailed report, as the latter can only interest the scientists, and since it may be found in full elsewhere, should any one wish to refer to it.

Yours respectfully,

LANGDON FROTHINGHAM.

EXPERIMENTAL INOCULATION OF CALVES WITH THE HUMAN
TUBERCLE BACILLUS.

The opinion has often been advanced that cattle are much less susceptible to the human tubercle bacillus than man is to the bovine.* As far as I have at present examined the literature, I have been unable to find any reference to works which might throw light upon this subject, with the exception of a short report by Smith;† hence it was that the following experiments were begun, with the hope that some data might be obtained which would tend to uphold, or reject, the above theory.

In the following experiments young calves were employed, which were the offsprings of healthy cows. In most instances the mother had been injected with tuberculin, to prove the presence or absence of tuberculosis. In cases where the mother was not subjected to this test, she was, as far as clinical symptoms are evidence of the non-existence of this disease, apparently free from tuberculosis. In the first experiments the calves were also tested with tuberculin. The experiment animals were kept in a building which had never before been used for housing animals, and the milk which these calves were fed upon came from tested cows.

Autopsies were made with the greatest care, that no tuberculous lesion should escape detection; and many suspicious bits of organs were reserved for later microscopic examination, though, as a rule, with negative results.

Experiment No. 1.—Inoculation of Calves with Pure Cultures of the Human Tubercle Bacillus.

This bacillus was obtained directly from the liver of a child, about one year previous to these experiments. The culture used was one month old upon blood serum, and, as near as I was able to ascertain, about the twentieth generation. A suspension of this culture was made in boiled distilled water, and 1 cubic centimeter of this suspension was injected into the calves.

CALF I. (three months old; from tested mother; calf tested with tuberculin one week previous to inoculation).—The inoculation was made by injecting one cubic centimeter of the above suspension of tubercle bacilli into the abdominal cavity. After five weeks this calf was injected with tuberculin, and showed the following reaction:—

* The terms human and bovine tubercle bacillus are used in this article for the sake of convenience, not because the two organisms are to be considered as absolutely different bacteria, though they are, in all probability, varieties, according to virulence of the same bacillus.

† Theo. Smith, "Transactions of Association of American Physicians," 1896.

		Degrees F.
Time:	8.30 P.M. Normal temperature,	. . . 101.1
	7.30 A.M. After injection, . . .	102.2
	9.30 A.M. After injection, . . .	105.0
	11.30 A.M. After injection, . . .	104.1
	1.30 P.M. After injection, . . .	102.2
	3.30 P.M. After injection, . . .	101.3

Six weeks after inoculation this animal was killed, and the autopsy was as follows:—

Autopsy.—Beneath the point of inoculation, upon the surface of the rumen, was a firm nodule about the size of a pea, and in the immediate neighborhood another similar but smaller nodule. On the parietal surface of a portion of intestine a similar nodule, about the size of a pea.

In the mesentery was a nodule about the size of a large brown bean. This was irregular or rough in outline, and showed numerous minute more or less elevated tubercles, in which calcification was just beginning. This presented typical microscopic appearances of a tuberculous lesion.

On the parietal surface of the peritoneum there were perhaps twenty minute nodules, grayish-white in color, rounded in form, firm to the touch, and varying in size from almost a pin point to a fairly good-sized pin's head.

On the peritoneal surface of the spleen there were four or five small circumscribed nodules, from the size of a pin's head to that of a very small pea.

No other lesions were found, though a careful search was made, cutting every organ into small pieces.

Microscopic Examination of Above Lesions.—Sections of the nodules on the surface of the intestine and the nodule in the mesentery showed the typical microscopic tubercle, with necrosis, giant cells and bacilli. Although many sections of the other lesions (nodule on rumen, nodules on the spleen and those on the parietal surface of the peritoneum) were carefully studied, I was unable to obtain absolute proof of their tuberculous nature.

CALF II. (about three weeks old; tested with tuberculin one week previous to inoculation; mother not tested).—The inoculation was made exactly as in the case of Calf I. Five weeks after inoculation the animal reacted to tuberculin as follows:—

		Degrees F.
Time:	8.30 P.M. Normal temperature,	. . . 101.4
	7.30 A.M. After injection, . . .	103.3
	9.30 A.M. After injection, . . .	103.3
	11.30 A.M. After injection, . . .	104.0
	1.30 P.M. After injection, . . .	103.0
	3.30 P.M. After injection, . . .	103.0

Five months after inoculation this calf was killed, and the result of the autopsy was as follows:—

An inguinal lymphatic gland, on the side corresponding to that upon which the inoculation was made, was enlarged and contained several well-marked caseous tubercles.

The *omentum* was *studded* with nodules of various sizes (from scarcely visible dots to the size of a pin head), many of which were isolated, again occurring as confluent masses. Some of these nodules, when confluent, were the size of a brown bean, and slightly calcified. Similar minute nodules were scattered here and there through the mesentery, only when confluent reaching the size of a pea.

Several mesenteric glands were enlarged, and contained small caseous tubercles; other organs were normal.

Microscopic examination of the nodules in the omentum proved them to be tubercles.

CALF III. (three weeks old; tested one week previous to inoculation; from tested mother).—The inoculation was made by injecting one cubic centimeter of the suspension of tubercle bacilli above described into the trachea. Five weeks later this calf was injected with tuberculin, and reacted as follows:—

				Degrees F
Time:	8.30 P.M.	Normal temperature,	.	101.0
	7.30 A.M.	After injection, .	.	105.3
	9.30 A.M.	After injection, .	.	105.2
	11.30 A.M.	After injection, .	.	106.2
	1.30 P.M.	After injection, .	.	104.2
	3.30 P.M.	After injection, .	.	105.0

Six weeks after inoculation the animal was killed, and the autopsy was as follows:—

Subcutaneously at the point of inoculation was a tuberculous lesion about the size of a nut, which showed several small centres of caseation.

In the neighboring superficial muscles there were several small nodules, showing beginning caseation, and evidently tuberculous in nature.

Beneath the point of inoculation, in the deeper cervical muscles to the right of the trachea, there was an enlargement the size of a large hen's egg, reaching to the cervical vertebræ. It was fluctuating to the touch, and contained a clear, watery fluid, in which were numerous flat, yellowish-white flakes (later microscopic examination of these flakes showed numerous tubercle bacilli). The wall of this cyst was thick and fibrous, its internal surface

pale and delicately honeycombed, the external irregularly nodulated with small tubercles, undergoing caseation. This whole enlargement contained five such cysts of different sizes.

The lymphatic glands on either side of the trachea, and especially those near the point of inoculation, were enlarged to the size of a horse-chestnut, and upon section showed necrotic areas and calcification.

In the *lungs* were several small, opal white nodules, scarcely the size of a pin's head. These were mostly found in the anterior lobe of the left lung.

In the *liver* were several (fifteen to twenty) small, well-defined, yellowish spots, as a rule pin-head in size, and mostly just beneath the capsule; only three such were found in the deeper parenchyma of the organ.

The *microscopic examination* of the above lesions showed them all to be of a tuberculous nature. The tubercles in the lungs and liver were exceedingly small, but perfectly typical in structure, though it was only after prolonged search that one or two tubercle bacilli were discovered.

CALF IV. (two months old; not tested; not from tested mother).—The inoculation was made into the trachea, as in the preceding case. Tested with tuberculin at the end of five weeks, this animal reacted as follows:—

				Degrees F.
Time:	8.30 P.M.	Normal temperature,	.	102.0
	7.30 A.M.	After injection, .	.	104.2
	9.30 A.M.	After injection, .	.	105.0
	11.30 A.M.	After injection, .	.	104.3
	1.30 P.M.	After injection, .	.	104.0
	3.30 P.M.	After injection, .	.	104.1

Calf IV. was killed five months after inoculation, and the *autopsy showed absolutely no lesions whatever*. Nothing abnormal could be found in the neighborhood of the point of inoculation, and nothing suspicious was found elsewhere in the body, save a very few yellow spots just beneath the capsule of the liver, and two or three similar ones in the deeper tissue of this organ. These were pin-head in size, and were thought to be tubercles similar to those found in the liver of Calf III.; but later microscopic examination showed them to consist simply of an increase in the connective tissue about some of the blood vessels and neighboring bile-ducts, and in one instance a small abscess. (For the possible explanation of the reaction of this calf to tuberculin, see summary.)

CONTROL EXPERIMENTS.—As control experiments of the above four, two guinea pigs were inoculated, each with one-half cubic centimeters of the same suspension of human tubercle bacilli that was used to inoculate calves 1 to 4.

Guinea Pig 1 was inoculated by injecting the fluid into the *abdominal cavity*. At the end of four weeks this pig was killed, and the autopsy showed:—

Inguinal glands swollen, but not caseous.

Both testicles markedly tuberculous and caseous.

Tuberculosis of the penis with caseation (tubercle bacilli were plenty in the caseous material of the testicles and penis).

Guinea Pig 2.—One-half cubic centimeter of the above suspension of tubercle bacilli was injected into the *trachea*. Animal killed at the end of three months.

Autopsy.—Tracheal and post-pharyngeal lymphatic glands enlarged, and in one instance caseous (from this, tubercle bacilli were demonstrated in cover-glass preparations).

The *lungs*, *liver* and *spleen* were studded with miliary tubercles.

Experiment II.—*Inoculation of calves with human tuberculous sputum*.

The sputum used was rich in tubercle bacilli, and but few other organisms were present. The sputum was mixed with boiled, distilled water, and inoculated by means of a hypodermic syringe. A small drop of this mixture showed numerous tubercle bacilli when examined with the microscope.

CALF V. (three weeks old; from tested mother; calf not tested).—Inoculation was made subcutaneously, with two cubic centimeters of the above mixture of sputum and water.

				Degrees F.
Time:	8.30 P.M.	Normal temperature,	.	102.4
	7.30 A.M.	After injection, .	.	103.3
	9.30 A.M.	After injection, .	.	105.3
	11.30 A.M.	After injection, .	.	105.2
	1.30 P.M.	After injection, .	.	104.2
	3.30 P.M.	After injection, .	.	104.1

This animal was killed at the end of five and one-half months. The autopsy was made by one of the Cattle Commissioners, and he was unable to find any pathological changes, save a slight enlargement of a mediastinal lymphatic gland and a small spot in the liver, which he did not consider a tubercle. A guinea pig was inoculated with pieces of this gland and the lesion in the liver, and at the end of two and a half months this guinea pig was killed, and I was unable to find anything abnormal at the autopsy.

CALF VI. (three weeks old; not tested; from tested mother).—The inoculation was made by injecting two cubic centimeters of the mixture of sputum and water in the trachea.

			Degrees F.
Time:	8.30 P.M.	Normal temperature,	. . . 101.4
	7.30 A.M.	After injection, . . .	. . . 104.2
	9.30 A.M.	After injection, . . .	. . . 106.0
	11.30 A.M.	After injection, . . .	. . . 106.2
	1.30 P.M.	After injection, . . .	. . . 105.0
	3.30 P.M.	After injection, . . .	. . . 105.0

The animal was killed four months and nine days after inoculation.

Autopsy at the Point of Inoculation.—Just beneath the skin a firm, partly calcified and partly caseous tubercular mass, the size of a horse-chestnut. Beneath this in the muscles were numerous small, firm, partly caseous and calcified tubercles, extending for several inches in the long direction of the muscles. No other lesions were found.

Microscopic Examination.—Cover-glass preparations from the caseous material of the lesion at the point of inoculation and the tubercles in the muscles showed numerous tubercle bacilli.

CALF VII. (two and a half weeks old; not tested; from tested mother).—Inoculation the same as the preceding.

			Degrees F.
Time:	8.30 P.M.	Normal temperature,	. . . 102.1
	7.30 A.M.	After injection, . . .	. . . 102.2
	9.30 A.M.	After injection, . . .	. . . 103.0
	11.30 A.M.	After injection, . . .	. . . 103.1
	1.30 P.M.	After injection, . . .	. . . 102.0
	3.30 P.M.	After injection, . . .	. . . 101.2

Killed four months and nine days after inoculation.

Autopsy.—Subcutaneously at the point of inoculation a typical microscopic tubercle the size of a pea. The underlying muscles contained a few small tubercles, mostly more or less calcified. These lesions were similar, but by no means so extensive as in the preceding case.

Liver.—Just beneath the capsule and close to the gall-bladder was a yellowish nodule the size of a very small pea, with an apparently caseous centre. A few other smaller yellowish spots were also found, but all were just beneath the capsule of the liver. No other lesions were found.

Microscopical examination of two of the nodules in the liver showed them to be tubercles in histological structure, though no

bacilli could be found. Sections were also made through other similar-looking lesions, but they proved to be non-tubercular in structure.

CONTROL EXPERIMENTS. — As control experiments of the preceding three, two guinea pigs were inoculated, each with one-half cubic centimeter of the same sputum mixture which had been used for the calves.

Guinea Pig 3 was inoculated subcutaneously. This animal died five days after inoculation.

Autopsy. — Extensive fibrino-purulent inflammation, extending over nearly the whole surface of the abdomen, both subcutaneously and between the abdominal muscles. Microscopic examination of the purulent material showed great numbers of pneumococci, and pure cultures of the same organisms were obtained from the heart's blood. (Cause of death, infection with pneumococci.)

Guinea Pig 4. — Inoculation made into the trachea.

Killed at the end of five and a half weeks.

Autopsy. — At the point of inoculation a tubercular abscess the size of a horse-chestnut. The pus in this abscess contained many tubercle bacilli.

Lungs, Liver and Spleen: milary tuberculosis.

SUMMARY.

From so few experiments it is impossible to claim any absolute scientific evidence that cattle are less susceptible to the human tubercle bacillus than they are to the bovine. For such a statement to be of scientific importance, many experiments in this line must be made, and, at the same time, calves must be inoculated with the bovine tubercle bacillus for comparison.

Reviewing the results of these few experiments upon calves, we have the following: —

1. Of the four calves inoculated with a pure culture of the human tubercle bacillus, only three showed any post-mortem lesions of tuberculosis, and in no instance were these changes extensive. The most marked lesions were in the immediate vicinity of the point of inoculation (in abdominal inoculation, in the omentum and peritoneum; intratracheal inoculation, in the muscles of the neck and the lymphatic glands of the same region. It is possible that the needle did not enter the trachea in some of these cases.) The lesions elsewhere in the body were very minute, and only found by careful search. There was never anything approaching a general infection, as was the case in one of the control animals (*Guinea Pig No. 2*). That the lesions in *Guinea Pig 1* remain localized in the penis and testicles is inexplicable.

That Calf IV. should have reacted to tuberculin may possibly be explained in one of two ways, considering, of course, that the tuberculin was good and the test properly performed: (*a*) That, at the time of injection of tuberculin, tuberculosis really did exist to some trifling extent, and that before death this or these lesions had completely healed, or (*b*) that some small tuberculous centre escaped detection at autopsy.

2. Of the three calves inoculated with human sputum, rich in tubercle bacilli, one was free from tuberculosis, one showed nothing but local lesions in the neighborhood of the point of inoculation, while the third, besides minor local lesions, had only two to four small tubercles in the liver. On the contrary, one of the control guinea pigs was affected with general tuberculosis, which demonstrates the virulence of the bacilli inoculated, while the other, unfortunately, died of septicæmia.

From these facts we are certainly justified in *concluding*: —

That calves are apparently not particularly susceptible to the human tubercle bacillus. But, whether this non-susceptibility is due to a bacillus of diminished virulence for the bovine, or to the age of the animals experimented upon, or to some other cause, further experiment must demonstrate.

The work of this Board, in the control of animal disease, has become an exceedingly important question, and the close relationship between animal disease and public health is a matter of serious importance. Care should be taken, however, that the important agricultural interests of the Commonwealth are not imperilled.

If it were not for the many interests involved, there would be little question as to the proper method of handling them. The study of the best methods for the control of tuberculosis, for example, is a matter that has attracted a great deal of attention, and in it the student of political economy will find a subject that will tax his ingenuity to the utmost.

The agricultural aspect of the question is an important one. Bang has suggested the possibility of raising a healthy herd from a diseased one; and, where the herd is valuable, his suggestions are worthy of careful and extended experiment.

The advocates of extreme measures, on the other hand, have claimed that, if all the animals in the State were tested with tuberculin, the diseased animals killed, the barns disinfected, only such animals as pass the test allowed to mix

with the herd, and a strict quarantine observed, in a short time the entire State would be cleared up, and that the herds in the State would remain free from disease.

Those who object to this method say that the cost is too great. While it might be possible in certain herds, yet in many barns it is impossible to thoroughly disinfect and renovate them without great expense to the owner. It is difficult to pick out all the diseased animals in one test, and if all animals that reacted to the test were condemned, many of the best milking strains might be destroyed, and whole families that it had taken years of labor to produce would be wiped out of existence.

About a year ago a number of valuable herds in the State were tested with tuberculin, under promise from the owners to strictly observe certain conditions. Among those tested was one belonging to Mr. A, consisting of 81 animals. This herd was carefully tested, and the figures submitted to this Board, and 28 animals considered certainly diseased by the Board were condemned and destroyed, and a number were held for retest. The animals held for retest were kept in a separate pasture, and were not allowed to mingle with the rest of the herd. Of these, 13 animals were retested, condemned by the Board and killed, the others passed as sound. Before these cattle were allowed to join the herd the barn had been thoroughly disinfected, in accordance with the following statement:—

Owner's Statement.

We disinfected the barns in the following manner, August 10, 11 and 12. They were thoroughly washed with soap and water, the corners of cribs and stalls received careful attention. The floor of the stalls was relaid in new plank throughout. We then used Labarague's disinfecting chlorinated solution in full strength as a disinfectant. We used 8 or 10 barrels of it, and every particle of wood received a generous quantity, after which the windows and doors were stopped securely and chlorine gas was generated for five or six hours. After this the stalls, sides and overhead received a coat of paint or varnish. This barn, in which are always kept the cows in milk, ties up 50 head. It is 101 feet long by 46 wide, and 9 foot post. There are 9 windows on the west side, and 8 on the east side, each 5 by 3 feet, besides win-

dows in the double doors facing south. There is a ventilator in the north end, 15 by 15 inches; two near the middle of the ceiling, 2 by 3 feet; and 2 more, 15 by 15 inches. Besides, there is a ventilating arrangement on each window.

In the original test 5 head were held for retest, only 1 responding. This retest was made Nov. 7, 1895. Four of the Holsteins were slaughtered for beef at one time and another during the winter, and passed inspection at the slaughter houses, and quite a number of the grades have been fattened and killed, with the same result. All of the cattle have been extremely well since the test, and it was extremely satisfactory.

In October of this year, sixteen months after the first test, the farm was again visited, and one lot (of 50 head) was tested. These cattle were in the same barn. The animals tested consisted of 29 of the original lot; of the others, 18 were Vermont cattle, and these had been tested carefully before being shipped, especial pains being taken to secure only healthy animals. Three others, not tested, were introduced into the herd on or about September 30, and at that time Mr. A notified the Board that it was expected that the entire herd would be re-tested immediately. However, because of the difficulty in securing sufficient tuberculin, a delay of a few weeks occurred, and it was not until October that two members of the Board visited the herd and tested the lot. Of the 50 animals tested, 27 reacted, were condemned and killed, 25 of which proved to be tuberculous upon post-mortem examination.

The herd belonging to Mr. B, consisting of 37 animals, was tested by a member of this Board Sept. 5 and 6, 1895. Two animals which reacted were condemned and killed, and proved to be tuberculous upon post-mortem examination.

On Dec. 22 and 23, 1896, the herd was again tested, numbering 25 animals, none of which reacted to the test.

Owner's Statement.

We would say that the stable where our cattle were kept when tested for tuberculosis in September, 1895, was 20 feet wide and 8 feet high. The stalls and mangers are 40 inches wide. The cattle face the barn floor, which is 12 feet wide, with 15 feet space above.

Cattle are fastened with chains when in stalls in the winter, and in the summer by fixed stanchions; managers for feeding are open directly onto the barn floor.

The front feet of cattle are designed to be three or four inches lower than the manger and barn floor. Mangers are swept clean twice a day.

The fronts of the stalls are provided with upper and lower folding lids, to provide for changes of temperature, ventilation and light. The windows in the rear of the cattle are 30 inches square, and placed on an average of not over 8 feet apart.

Running water in the barn and in the yard, available as weather permits; drainage all that could be desired, being on a side hill.

While the cattle have not been kept all the time in the stable referred to in the data above, their general surroundings and condition have been practically the same.

P.S. One question you ask, as to changes since being tested as referred to. We answer none, with the exception that 2 of the cows now present were bought at Brighton with certificate of tuberculin test,—they were bought the day following the killing of 2 condemned animals at Watertown.

The herd belonging to Mr. C, consisting of 27 animals, was tested Aug. 25 and 26, 1895. Twenty animals reacted to the test and were condemned and killed, post-mortem examination revealing tuberculosis in every case.

On Dec. 21 and 22, 1896, the remainder of the herd, consisting of 9 animals, 7 of which were in the original herd, 2 being tested animals that had been purchased after the test of 1895, was again tested. One reacted and was killed, and found to be tuberculous.

Owner's Statement.

I would say that the barn in which the cattle examined by Mr. Dennen in the summer of 1895 were kept is 100 by 40 feet, with L and lean-to.

The main barn has a driveway the whole length through the middle, with large rolling doors at both ends. The cattle stood on the north-west side, facing the driveway, and were thus in the main barn.

The lean-to is in the rear of the cattle tie-up, and the portion open toward the cattle is cut into open pens for cattle or horses.

There is a cellar under the main barn, open on the south-east side, and into the cellar the manure from the cattle is dropped through scuttles.

There are long windows over the large doors at either end of the driveway, and in the lean-to in the rear of the cattle three double sash windows; also windows at both ends of tie-up.

The cattle pass down to the cellar through a passageway in the lean-to, which is cut off from the tie-up by a rolling door, and from the cellar pass out into the yard on the south-east side of the barn. There is running water in a trough in the yard, where the cattle drink.

There is a small door from one end of the tie-up, leading directly out of doors.

The cattle are tied in stanchions and feed off the floor, with standing partitions to keep each animal's feed separate from the next one.

The sound animals were kept in the pasture after the examination until late in the fall, with the exception of one milch cow bought after the examination, which was put in the barn a little earlier in the fall, and kept at one end of the tie-up, by the open door.

Very soon after the examination the barn was fumigated by our veterinarian. I was not told what he used, but from the description of the way it was done, I think he used chlorine gas.

The barn had the large doors open all summer, and no cattle in it. In the fall, just before the cattle (with the exception of the one milch cow) were put in the barn, the standing partition and floor on which the cattle feed were removed and the boards used for fuel, and new floor and partitions built.

There were formerly doors on the south-east side of the cellar, to close it in in the winter; but during last winter, at least, they were kept open. The barn has a ventilating cupola.

The herd belonging to Mr. D, consisting of 25 animals, was tested Aug. 22 and 23, 1895; 6 animals were condemned and killed, and found to be tuberculous.

The herd was replenished with tested animals, and on Dec. 24 and 25, 1896, was again tested, there being 28 animals on those dates, 5 of which reacted to the tuberculin test.

Owner's Statement.

My stable is 80 feet long by 40 feet wide, with monitor roof. The stables are 9 feet high, and the centre or monitor part is 15 feet high, which gives each cow (25 in number) 1,372 feet air space, and it is lighted with 38 windows (6 lighted 9 by 15 glass), and also 72 lights in doors. There are 3 large ventilators in the monitor part that are never closed, and monitor windows are

arranged for ventilation. An air duct brings fresh air to each manger from outside the barn.

I use the Buckley device for water; two cows drink from each bucket.

All liquid manure is conveyed to a large tank outside the barn, and the manure cellar is well ventilated and well drained.

The herd belonging to Mr. E, after being tested and cleaned up in October, 1894, was retested on March 17 and 18, 1896. There were 80 animals in the herd, 78 of which were tested, 2 animals having a temperature too high at the time to be injected. Fourteen animals reacted or showed a suspicious rise in temperature; they were immediately separated from the remainder of the herd, were again retested June 19 and 20, at which time two were released, three were condemned and 9 were continued in quarantine. On Oct. 7, 8 and 9 these 9 quarantined animals were tested and condemned.

On Aug. 16 and 17 64 of the original herd and 1 animal which had been introduced recently were tested. None of the original animals reacted to the test, while the animal which had been introduced from outside reacted and was condemned, and upon post-mortem was found to be tuberculous.

From these records it will be seen that it requires not one examination alone, but more than one test and most thorough disinfection and renovation before a herd can be pronounced free from disease.

It is, perhaps, not amiss at this time to call the attention of your honorable body to the pamphlet issued jointly by the Board of Agriculture and the Hatch experiment station, on the work done by Professor Bang of Copenhagen.

A similar experiment is reported by Dr. Cooper Curtice in the "Journal of Comparative Medicine" for August, 1896. He reports that a valuable herd of Guernseys, belonging to Mr. R. A. Bordon of Easton, N. Y., were badly affected with tuberculosis. This herd was handled in the manner recommended by Professor Bang, with successful results. In referring to the matter Dr. Curtice says:—

The loss to Mr. Bordon and the State, through tuberculosis causing death of cattle, through the slaughter and separation of

affected cattle, and the loss of milk, has been great, but has been lessened by handling the herd in a conservative manner. The preservation of the blood of the old stock and building of the new herd on the same lines has been a positive saving of qualities it has taken years to gain.

One important part of the work of this Board is that which relates to the supervision of the large corps of inspectors appointed by the various cities and towns, and also under control of the local boards of health. This is the part of the work which is so essential for the protection of the public health. The members of the Board feel that steps should be taken to bring this department up to the highest standard possible.

The local authorities in cities and towns should be urged to appoint men of experience and judgment to this position. It does not do to appoint men who will cater for newspaper notoriety, and it does not do to appoint men for this work who know little and care less about it, or who are appointed for political reasons only.

Under the law, inspectors must be present at the time of slaughter, and inspect the carcasses of all animals slaughtered in slaughter houses. It is their duty under the present law to condemn to the rendering tank the carcass of any animal showing any evidence of tuberculosis, no matter how slight the lesion.

This is a question that should be considered most carefully. The interests at stake are so great that no mere feeling of sentiment should be allowed a place in the matter. The whole question should be carefully weighed and looked at from every possible point of view before deciding what changes in the law, if any, are necessary. The total condemnation of meat is not of so much importance, of course, when only animals condemned by the local inspector are involved, these being only exceptionally fit for beef; but when one considers that a large percentage of valuable herds may be condemned, each individual animal of which, to all appearances, is in perfect physical condition, and on autopsy a number are found to be nearly free from disease, in the opinion of the Board, under a proper system of inspection the sale of such meat might be allowed.

Another important part of the work of the local inspectors is the inspection of the milch herds. In this connection the Board would specially call attention to the necessity of making a careful examination of the udder, and the immediate quarantining of the cow in which any abnormal condition of this organ is found. Cows showing any physical evidence of disease should immediately be quarantined, and in questionable cases, tested with tuberculin. No cows in a sickly or unhealthy condition are fit for dairy purposes, and their use as dairy cows should be prohibited.

A great deal has been made of Ernst and Peters' experiments at Mattapan, conducted under the auspices of the Society for Promoting Agriculture. In these experiments 36 cows in all were experimented with, and the bacillus of tuberculosis was found in the milk of 12 different animals.

Experiments were made by inoculating 88 guinea pigs with milk from 15 of these tuberculous cows. The milk from 6 was found capable of producing the disease, and 12 of these 88 guinea pigs became infected.

In another series of experiments, 90 rabbits were inoculated with milk from 19 different tuberculous cows. The milk of only 4 of the cows produced the disease, and only 6 of the 90 rabbits became infected.

Again, 48 rabbits were fed with milk from 5 tuberculous cows, and with milk known to be infected, and only 2 rabbits became diseased; both of these rabbits were fed on milk from the same cow (cow E), which was badly diseased.

Twelve healthy pigs fed on milk from these same cows gave a larger proportion of cases, 5 out of the 12 becoming tuberculous; but it should be noticed that 3 of the 5 were fed on milk from one cow (cow E). Further, it was milk from this same cow that infected the rabbits in the last series of experiments referred to.

It should be remarked that these experiments were carried on with the object of showing only that cow's milk may be dangerous even when the udder is not affected. Now, it must be remembered that at that time tuberculin was not known as a diagnostic agent for the detection of tuberculosis, and all of the cows used in these experiments were picked out by physical examination alone, and nearly all were badly diseased cows with generalized tuberculosis; while a large

proportion of cases of tuberculosis picked out by tuberculin, and showing no physical evidence of disease, are incipient cases, and may not be a source of danger. Often a careful examination has to be made before any pathological lesion can be detected on post-mortem examination. It is a curious fact that in a majority of cases where the reaction is high and well marked only slight tubercular lesions are found, while in such cases as are well advanced there is frequently no apparently characteristic reaction from tuberculin, and the examiner has to depend upon a physical examination alone to detect the disease. It is in these latter cases that the greater danger lies. If, then, care is taken to condemn all such cases, and the milk supply is obtained only from such animals as are in good general health and show no physical evidence of disease, the danger is very much reduced.

In taking this view of the matter, the Board does not wish to be understood as meaning that no further advance can be made in this direction; but, realizing that pulmonary consumption in the human family has steadily and uniformly decreased during the past forty-five years, the maximum and minimum death rates being 42.7 per ten thousand of the population in 1853, and 22.7 in 1893, it believes that there is no need for the adoption of more radical methods at the present time; and, further, it believes that advances can be made in other directions which will give better protection to the public, and result in great and immediate benefit to both producer and consumer.

Tuberculosis is not by any means the only danger to which the consumer is exposed through the use of impure milk. For years past the most fatal disease among infants has been milk diarrhœa, or cholera infantum. In this connection it has been claimed by certain parties that cholera infantum or milk diarrhœa is a disease of tubercular origin. This is a fallacy, and is misleading. Cholera infantum, as it is usually understood, refers to milk diarrhœa, or, more properly, acute mycotic diarrhœa of bacterial origin. Milk diarrhœa is not an inflammatory disease; there is little or no time for pathological changes to take place, and few pathological changes are observed after death. It is an acute

ptomaine poisoning, caused by the absorption of the products of fermentation, and due, as a rule, to improper feeding, and the presence of impurities and immense numbers of bacteria in the milk. The symptoms of milk diarrhœa are acute, and are not those of tuberculosis of the intestines.

Milk diarrhœa is probably the most common disease to which children are subject. In this connection we would call your attention to the mortality report of the Massachusetts Board of Health for 1895.

In this report it is shown that there were 5,463 deaths from phthisis at all ages, 2,676 deaths from cholera infantum, 1,801 deaths from diphtheria and croup, 748 deaths from typhoid fever, 649 deaths from scarlet-fever, and 98 deaths from measles.

In this report we see cholera infantum placed next to phthisis in the death rate. Now, in considering this subject, it must be remembered that the latest statistics show that by far the largest proportion of cases of phthisis occur in people who have recently moved into houses previously occupied by consumptives; while, on the other hand, cholera infantum is due almost solely to the ingestion of impure milk. Further, the deaths from phthisis include deaths at all ages, while cholera infantum occurs only in children under five years and practically under one year old.

In New Hampshire the proportion of deaths from cholera infantum is greater; for the year ending 1891 the report shows 695 deaths from consumption and 486 deaths from cholera infantum. The report then remarks: "Cholera infantum was the cause of more than one-third of all the deaths from prominent zymotic diseases in New Hampshire in 1891."

In Ontario, for the year ending 1892, in a population of over 2,000,000, phthisis caused 2,592 deaths and cholera infantum 670; but among the 23,190 children under one year old cholera infantum caused 600 deaths, while phthisis caused 283 deaths.

These figures are pregnant with meaning. Cholera infantum, or milk diarrhœa, is purely a disease of infants, due as a rule to improper feeding with impure milk. In Massachusetts it was the cause of 2,676 out of 11,435 deaths from the six most prominent diseases; the cause of one-fourth of all deaths from all zymotic diseases in New Hampshire in 1891.

Milk diarrhœa is distinctly a preventable disease, and is due to uncleanness and filthy surroundings and to want of

attention in the care of milk. It is not enough to scald milk cans and wipe them out with a wet cloth, as the cloth will reinfect the cans, and destroy any good that might have resulted from previous cleansing.

To understand this matter thoroughly, it is necessary to recollect that the science of bacteriology has made wonderful strides of recent years. The study of these minute organisms is an important one. They are everywhere around us, and play an unrecognized though important part in every-day life.

The souring and curdling of milk is due to the development of bacteria which find their way into milk, either during or after milking; not only that, but the pleasant flavor and delicate aroma of good butter and cheese is due to the development of certain varieties of these organisms. On the other hand, other varieties, the bacillus *Coli communis*, for example, which is present in large numbers in the fecal matter, will spoil both butter and cheese; and it is probably this same *Coli bacillus* that is mainly responsible for the large proportion of cases of milk diarrhoea in infants, which occur so frequently during the summer months.

There are many ways by which various kinds of bacteria get into milk. A dairyman has only to look in the strainer, after milking, to find hair, dirt, scurf, scabs from sores and fecal matter in every pail, and all these are swarming with bacteria. Then, again, the milker's hands are rarely washed before milking; his clothes are dirty; greasy and soiled overalls are worn while he is at work; milk cans and milking utensils are frequently washed with water far from clean; even if scalded, they are often rinsed with water from a polluted well.

Then, after being shipped to Boston, the method of testing milk is very unreliable. In cold weather bacteria in the milk do not develop, and the milk tastes sweet; but, if the temperature is raised the bacteria will develop rapidly. In this way, milk when first brought in may appear sweet, but after it is mixed and the temperature raised, the bacteria will develop, and the entire quantity will be contaminated. This is a matter that ought to be taken up by the producer himself, and it might well be attended to by the New Eng-

land Milk Producers' Union, and, as a step in this direction, in a pamphlet issued by this union under the heading "What milk producers want," we find, in Section V., among the objects of the union, it is proposed "to insure better care by peddlers in the distribution of milk." This is the entering wedge; it is the recognition of the necessity for some action in the matter. The interests of both the producer and the consumer are identified in this matter, and the sooner both parties realize this fact, and co-operate with one another, the better it will be for both.

Among the many sources of contamination by which milk may become infected, probably none is more serious than the contamination of the water supply. In this connection, we quote from the "Farmers' Bulletin," No. 43, from the United States Department of Agriculture, on "The sewage disposal on the farm."

The chief dangers which threaten rural inhabitants are those arising from polluted drinking water. This is infected from the household excrement and barn-yard drainings, as will be described further on, and its use leads in the main to bowel disturbances, typhoid fever and dysenteric affections. It might be claimed that in an isolated homestead the danger is absent, because the night soil from the healthy household cannot contain the germs of typhoid fever, and therefore the well water cannot receive them from leaky cesspools and surface drainage. This would be true if the family lived secluded from other human beings. As the case stands, there is much more communication than is at first thought supposed. There is more or less coming and going of farm hands and other hired help, of tramps, peddlers, etc. The farmer travels more than formerly. He frequently visits neighboring communities. The children go to school. As it has been shown, there may be mild cases of typhoid fever passing unnoticed, perhaps, in a farm hand, for example, who leaves on account of ill health, and who has meanwhile, in his discharges, deposited the germs of this disease on the premises. It is evident that isolation nowadays does not exist except in remote thinly settled regions, and that disease germs may make themselves suddenly felt in an unexpected manner in any farmhouse.

There are other important reasons, however, why rural sanitation should not be neglected. The health of the large communities of people who draw their food supply from the country is in a

measure dependent on the health of the farming community. There is scarcely a city child who is not, in a degree, dependent for its health on the sanitary conditions prevailing in the house of the dairyman. Milk has been repeatedly shown to be the means of distributing typhoid fever and other diseases. Any vegetable foods from the farm, eaten raw, are liable to become carriers of infection under unsanitary conditions.

In many parts of our country other causes operate in making the health of many people depend on the proprieties of country homes. The thousands of city people who flock every summer to the country, and bring to the farming community considerable sums of money, should be properly protected against the dangers of polluted water and infected milk by the adoption of suitable methods of sewage disposal. Too frequently those who left the city for the purpose of gaining strength by breathing pure air, drinking pure water and eating pure food, only return with the germs of an often fatal disease within them, to swell the typhoid statistics of our large cities.

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The next subject to claim our attention is the protection of the sources of drinking water. In the country water, as a rule, is obtained from wells and springs. The important bearing upon well water of soil purity demands a few explanatory remarks concerning the origin of well water. Wells are excavations made into the ground to a variable depth until water is reached. This water is denominated ground and subsoil water. Its origin may be better understood if for the moment we conceive the surface of the earth as more or less irregular, and entirely impervious to water. The rain would collect on this surface and form lakes, ponds and streams, according to the configuration of the surface. If, now, we conceive this surface covered with sand or other porous earth, to a greater or lesser height, and the top of this be considered the earth's surface, the water will remain in the same position, but it will be buried within, and fill the pores of the overlying soil, as subterranean lakes, ponds and streams. In digging a well we remove the porous layer of earth until we reach these subterranean streams or reservoirs of ground water. If the above description be thoroughly understood, the condition under which well water may be obtained at different depths will become intelligible, and it will also appear plain why ground water may flow at any surface stream and pick up on its way various substances which have percolated the ground.

Wells are exposed to contamination in two ways. The surface water from rain, house slops and barn-yard drainage may find its

way into the well at or near the surface of the ground; or, the ground-water stream supplying the well with water may in its subterranean movements, encounter cesspools or seepings from cesspools, and carry with it soluble and suspended particles, some of which may enter the well. There can be no doubt that a large percentage of the wells are exposed to contamination with refuse matter in the manner described; and it now remains to gauge the danger to health and life which may be carried in the contaminating substance. The danger of typhoid fever bacteria entering the water has already been mentioned. These may be washed in from the surface, or they may pass from cesspools near by through fissures in the ground, passages dug by rats, etc. Whether such bacteria can pass through the pores of a compact, unbroken soil from a cesspool to a well near it is a matter not fully settled. Since, however, the actual condition of the deeper layers of the soil between cesspool and well cannot be known, it becomes imperative to prevent all pollution of the ground-water current supplying wells, by either abolishing the cesspools or else placing them at a considerable distance from all sources of water.

Besides typhoid fever bacteria, those organisms which cause digestive disturbances and severer troubles, such as diarrhœa, dysentery and possibly other unknown diseases, may be carried into well water. During cholera epidemics, polluted wells might form centres of infection. Eggs of animal parasites may be washed in from the surface. Again, the barn-yard manure, representing the mixed excrement of various animals, may, under certain conditions, be bearers of disease germs, and such excrement should, under no condition, be looked upon as entirely harmless to human beings.

Besides the protection of ground water near the well from pollution emanating from cesspools, etc., the surface of the ground about the well should be kept free from manure, slops and other waste water; hence the well should not be dug under or close by the house, saturated with manure. It should be surrounded by turf, and not by richly manured, cultivated or irrigated soil. The ground immediately around it should slope gently away from it, and be paved if possible. The waste water from the well should not be allowed to soak into the ground, but should be collected in water-tight receptacles, or else conducted at least twenty-five feet away in open or closed channels which are water-tight.

It seems to us that this subject is important, and during the past year considerable pains were taken to collect data on this subject, etc. For the full report we must refer you

to pages 26-32. We would call your special attention, however, to one of these cases reported.

In this (Quincy) case it will be seen that the drain from the kitchen sink, the privy vault and the manure pile are all in the neighborhood of the well, and an analysis of the water shows it to contain a large amount of organic matter. Your attention is called to the milk cans hanging to dry and air at the end of the house. These cans are rinsed daily, after washing, with water from the well. It can easily be seen how dangerous this water would become in case of sickness in the family. Many outbreaks of typhoid fever can be traced to this source of infection.

Prof. W. T. Sedgwick, in a paper on the milk supply problem, read before the Society of Arts, in Boston, notices this same danger: —

In 1890 he made a careful bacteriological investigation of the milk supply of Boston, which showed that much of the milk publicly sold was far from fresh, and was subject to contamination by the germs of disease. Since that time several serious epidemics of typhoid fever in Massachusetts have been traced by him to the use of infected milk, and grave suspicions, to say the least, of the spread of tuberculosis by means of the milk supply, have been raised and have not been allayed. . . .

As a matter of fact, within the last few years a number of epidemics have been traced to some man in the milk house who was suffering from typhoid fever, while working over the milk, and it is believed that slight infections of this kind occur oftener than is generally supposed.

In the *Journal of Comparative Medicine*, for December, 1896: —

Typhoid infection in a two and a half year old child from drinking milk not thoroughly boiled. In May, 1892, a girl two and a half years old became suddenly sick from symptoms of irritation of the bowels, relieved by evacuations and emissions of urine. The treatment adopted, in which other food replaced milk, quickly diminished the symptoms, which reappeared again as soon as milk was given. Marked typhoid infection also developed, lasting for some weeks. At the end of the fifth week the child was convalescent. For the reason that the child had been fed exclusively with milk, and because the symptoms after disappearing suddenly reappeared when the milk diet was recommended, the physician

deemed himself justified in concluding that the milk contained the injurious elements. A further reason was found in the fact that the four-year-old sister of the patient, who had drunk of the same milk, but not such a large quantity also suffered from diarrhœa at the same time that her younger sister was sick. The bacteriological investigation of the suspected milk and evacuations of the patient gave the following results: in the milk a bacterium was found in great quantity, which presented the morphological and biological characteristics of the bacterium *coli commune*. In the evacuations the same bacteria were found, as well as in the blood of mice which had been infected with the fecal matter of the patient. It is a noteworthy fact that these bacteria have been found in a virulent condition in milk which had been boiled. This can only be explained on the ground that the milk had not been boiled enough, or that the boiled milk after it had become cool had been poured back into the can, which had not been cleansed sufficiently.

Perhaps one of the most interesting cases of typhoid fever, due to infection from milk, occurred in Plympton, England, August, 1870. A certain milk dealer sold milk to one hundred and forty-five families, and of the one hundred and forty-five, seventy contracted the disease. The way the disease picked out the customers of the dairy in the various streets was most striking. In one long street the milkman supplied three families, and two of them were affected. In a block of twenty-five houses he supplied four families, and they were all attacked. In a new neighborhood, where there were about seventy houses, he supplied four families, and three had the disease. In a square of fifty-nine houses he supplied four, and all had it, and so on. On the other hand, there were scarcely any cases in those families supplied from other sources.

The infection in this case was traced to an underground tank in the cow house, which was contaminated from a leaking sewer, and the water in the tank had been used to wash the milk pails, and in this way the milk became infected.

CHANGES IN THE BOARD.

The term of Dr. Charles P. Lyman of Boston as a member of this Board expired in September, and Acting Governor Wolcott appointed Dr. John M. Parker of Haverhill

to the vacancy September 30. He was confirmed the Thursday following and qualified October 26, attending a meeting of the Board on that date for the first time.

The term of Mr. L. F. Herrick also expired in September, and he was reappointed.

The office of secretary being vacated by Dr. Lyman's retirement, Commissioner L. F. Herrick was elected to the vacancy. Dr. Frederick H. Osgood of Brookline tendered his resignation as a member of the Board November 30, and it was accepted by the acting governor December 7.

The acting governor appointed Dr. Austin Peters of Jamaica Plain a member of the Board, to fill the vacancy thus caused, December 10. He was confirmed December 17 and qualified December 19. He attended a meeting of the Board on that day.

Dr. Osgood's retirement leaving the chairmanship of the Board vacant, Dr. Peters was elected chairman, and, Mr. Herrick declining to continue in the position of secretary, Dr. Parker was elected to that vacancy. Both these elections were unanimous.

At the beginning of the year the Board found itself with several hundred animals in quarantine, at the expense of the State, and without funds to defray the expense incident to testing them and destroying those found diseased. While the Legislature made an early appropriation of \$50,000 for these expenses, the inspectors throughout the State, who are independent public officers, were constantly quarantining more suspected animals; so that, while the Board was able to dispose of a considerable portion of the cases, it was not until the regular appropriation was made, June 5, that it was possible to entirely clear away this accumulation of work. At this time the quarantine expense on animals thus held amounted to \$28,223.43.

To obviate the recurrence of this condition of affairs, the Legislature passed the following, which was approved June 2, 1896:—

If the sum hereby appropriated shall be expended before the first day of January in the year eighteen hundred and ninety-seven, the auditor shall immediately certify that fact to the Board of Cattle Commissioners. Upon receipt of such certification,

said Board shall immediately notify each city and town and each inspector throughout the Commonwealth that said appropriation is exhausted, and thereafter no Massachusetts cattle shall be quarantined until a further appropriation is made, and all Massachusetts cattle quarantined at the time such notification is issued shall be immediately released.

During the year ending Dec. 15, 1896, the Board had at its disposal appropriations amounting to \$300,000. There has been paid for 5,198 head of cattle condemned as tuberculous the sum of \$173,206.35; there are at the present time 550 warrants for cattle which have been condemned and killed, in process of approval, amounting to \$16,040.25; there has been paid for quarantine expense on animals \$28,223.43, making a total of \$217,470.03 which has been returned to the cattle owners of the Commonwealth.

The Board has asked the Sergeant-at-Arms for quarters at the State House, and have his assurance that at an early date the request will be granted. It is believed that with this change of location the work of the Board can be more satisfactorily handled, and that its administrative expenses can be materially reduced.

The Board is of the opinion that such laboratory work as will be necessary in the future can be accomplished with comparatively slight expense, and proposes to rearrange this department with this view at an early date.

The Board is convinced that the restrictions against the testing of herds upon the request of the owners, which was a provision in the bill of last year making the appropriation for the Board, should not be re-enacted. The Board should have power to do this work wherever owners will bind themselves to follow it by a strict compliance with the sanitary regulations of the Board.

Respectfully submitted,

AUSTIN PETERS, *Chairman*,
JOHN M. PARKER, *Secretary*,
MAURICE O'CONNELL,
LEANDER F. HERRICK,
CHARLES A. DENNEN,
Board of Cattle Commissioners.

